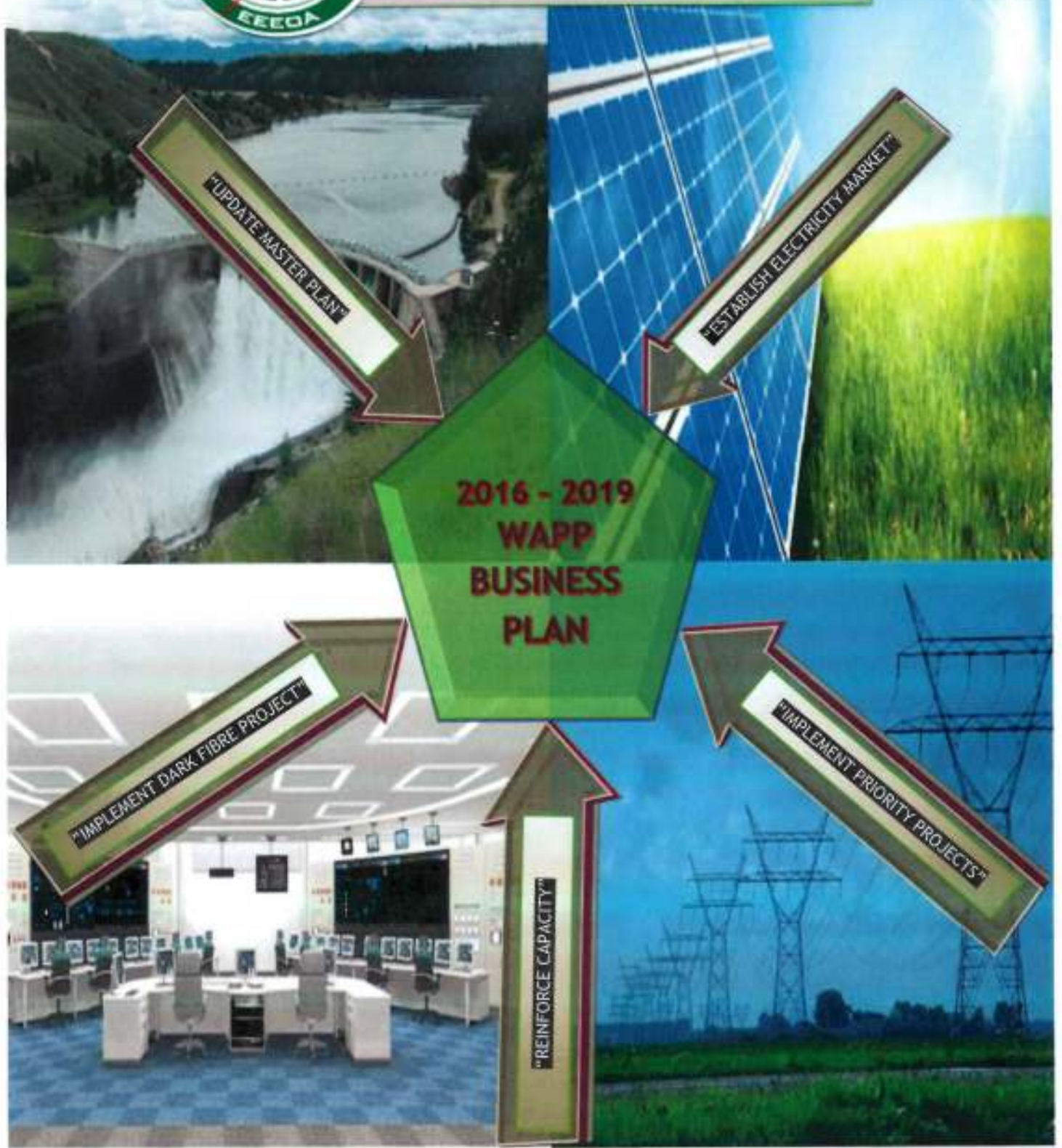




## WEST AFRICAN POWER POOL



OCTOBER 2015

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## GLOSSARY OF TERMS

A&F	Administration and Finance
ACAD	African Carbon Asset Development Facility
ACP	African Caribbean Pacific
AETS	Application Européenne de Technologies et de Services
AFC	Africa Finance Corporation
AFD	Agence Française de Développement
AfDB	African Development Bank
ASA	Ancillary Services Agreement
BOAD	Banque Ouest Africaine de Développement
CAC	Control Area Center
CBPI	Capacity Building Program Initiative
CEB	Communauté Électrique du Bénin
CEET	Compagnie Energie Electrique de Togo
CENIT	CENIT Energy Limited
CenPOWER	CenPOWER Generation Company Limited
CFPP	Centre de Formation et de Perfectionnement de La Senelec
CIE	Compagnie Ivoirienne d'Electricité
CI-ENERGIES	Société des Energies de Côte d'Ivoire
CLSG	Côte d'Ivoire - Liberia - Sierra Leone - Guinea
ContourGlobal	Contour Global
DCC	Distribution and Commercialisation Committee
EAGB	Empressa Publica de Electricidade e Agua de Guine-Bissau
ECG	Electricity Company of Ghana
ECOWAS	Economic Community of West African States
EDF	Electricité de France
EDG	Electricité de Guinée
EDM-SA	Energie du Mali-SA
EDSA	Electricity Distribution and Supply Authority
EIB	European Investment Bank
EMS	Energy Management System
EOC	Engineering and Operating Committee
ERERA	ECOWAS Regional Electricity Regulatory Authority
ESIA	Environmental and Social Impact Assessment
EU	European Union
EU-A ITF	European Union - Africa Infrastructure Trust Fund
FC	Finance Committee
GEF	Grid Emission Factor
GIZ	Gesellschaft für Internationale Zusammenarbeit
GRIDCo	Ghana Grid Company
GTG	GTG Energy Limited
GTS	GTS Engineering Services
HRGC	Human Resources and Governance Committee
ICC	Information and Coordination Centre
IsDB	Islamic Development Bank



JDA	Joint Development Agreement
km	Kilometer
KPI	Key Performance Indicator
LEC	Liberia Electricity Corporation
M&E	Monitoring and Evaluation
Mainstream	Mainstream Energy Solutions Limited
MIS	Management Information System
MW	Megawatt
NAWEC	National Water and Electricity Company Limited
NEPAD-IPPF	New Partnership for Africa's Development - Infrastructure Project Preparation Facility
NIGELEC	Société Nigérienne d'Electricité
OMVG	Organisation pour la Mise en Valeur du fleuve Gambie
OMVS	Organisation pour la Mise en Valeur du fleuve Senegal
ONE	Office National de l'Electricité du Maroc
PHCN	Power Holding Company of Nigeria
PIPES	Planning, Investment Programming and Environmental Safeguards
PPA	Power Purchase Agreement
PPP	Public Private Partnership
RSMO	Regional System Market Operator
RTE	Réseau de Transport d'Électricité
SBEE	Société Béninoise d'Energie Electrique
SCADA	Supervisory Control and Data Acquisition
Senelec	Société Nationale d'Electricité du Sénégal
SOGEM	Société de Gestion de l'Energie de Manantali
SONABEL	Société Nationale d'Electricité du Burkina
SPEC	Strategic Planning and Environmental Committee
SWOT	Strengths Weaknesses Opportunities Threats
TCN	Transmission Company of Nigeria
TRANSCO CLSG	CLSG Regional Transmission Company
TSA	Transmission Service Agreement
UA	Unit of Account
USAID	United States Agency for International Development
VRA	Volta River Authority
WAPP	West African Power Pool
WB	World Bank



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## FOREWORD

The drive of the Economic Community of West African States (ECOWAS) to preserve the steady economic growth witnessed by the West Africa region in recent years, despite the challenging environment, has placed high expectations on enabling sectors such as energy. The needs of primary economic drivers such as manufacturing and agriculture imply that the power supply inadequacies currently faced by the sub-region needs to be turned around to ensure that the development is aptly fuelled. The West Africa region is home to diverse energy assets but the challenge to convert these resources into power production and the ensuing revenue into public benefits is formidable. Regional integration of national power systems through a power pool mechanism, continues to be considered as a primary contributor to the array of solutions that can finally resolve the power supply situation. As the issues for address for an emerging power pool continue to be diverse, there is an unchanged need to establish strategic priorities for focus to ensure that the limited resources available are optimally employed to render maximum impact.

It is on this premise that the 2016 – 2019 WAPP Business Plan has been developed under the initiative and leadership of a new Secretary General, as a cogent sequence to the 2012 – 2015 Business Plan. The Plan, again prepared in-house, epitomises the outcomes of a collaborative effort by the Staff and Executives of the WAPP Secretariat during its preparation. The new Plan reflects the outcomes of a strategic evaluation of the realisations during the preceding Cycle and proposals on realistic actions to be undertaken in the medium term to meet set Objectives. Moreover, the main thrust of this Business Plan is the recognition that through the expected completion of the WAPP Information and Coordination Center (ICC) during the period, the regional electricity market shall have been effectively launched and shall need to be operational. Furthermore, the Business Plan shall strive to ensure that all 14 mainland ECOWAS Member States shall be completely interconnected within the period. In a bid to ensure that the overall investment program at the regional level remains coherent and relevant, the Business Plan also foresees an updating of the ECOWAS Revised Master Plan for Generation and Transmission of Electrical Energy to take into account developments occurring within the power sectors of ECOWAS Member States.

The Business Plan also highlights the Resources required over the period for achieving the Goals. The implementation of the infrastructure program shall continue to assume the support of WAPP Partners, both traditional and private, whilst WAPP Member Utilities shall continue to demonstrate their commitment to the Organisation by remitting timely contributions to fund the operations of the Secretariat.

## 1. EXECUTIVE SUMMARY

The implementation of the 2012 – 2015 WAPP Business Plan was done in a sub-regional context marked by strong economic growth but characterized by non-foreseen exogenous factors that impacted on the electricity sub-sector in West Africa. Ranging from national political crises in some ECOWAS Member States to the unfortunate Ebola health epidemic that threatened the very fabric of regional integration, the operational capabilities of WAPP Member Utilities was further pressured by low rainfall affecting the functionality of key hydropower assets as well as unavailability of gas to fuel thermal generation plants that resulted in poignant electricity shortages managed by load shedding. The downward trend on the price of fuel did however provide some little reprieve for WAPP Members largely dependent on fossil fuel-based power generation.

Notwithstanding these challenges, the WAPP did manage to register some modest strides during this Business Plan cycle. Prominent among the realisations perhaps was the successful change in Secretary General of the WAPP Organisation in July 2015 after a competitive process that involved an independent Recruitment Agency. The achievements also included among others, the preparation of an updated Master Plan for the Generation and Transmission of Electrical Energy that was subsequently adopted by the Authority of the ECOWAS Heads of State and Government through Supplementary Act A/SA.12/02/12, the transformation of the WAPP Information and Coordination Center (ICC) into the independent Regional System Market Operator (RSMO) charged with the operationalization of the regional electricity market, and the securing of funding to realise a first phase of the ICC Project. Noteworthy also is the commissioning of the 240 MW Kaleta Hydropower Facility in Guinea, the 400 MW Bui Hydropower Facility in Ghana, and the 60 MW Felou Hydropower Facility under the Organisation pour la Mise en Valeur du fleuve Senegal (OMVS). The securing of financing to implement the 225 kV Côte d'Ivoire – Liberia – Sierra Leone – Guinea (CLSG) Interconnection Project, the 225 kV Bolgatanga (Ghana) – Ouagadougou (Burkina) Interconnection Project and the 64 MW Mount Coffee Hydropower Project in Liberia was also realized during this period. The development of the CLSG Project in particular involved among others, the mobilization of four (4#) Funding Agencies, the establishment of a Special Purpose Company called CLSG Regional Transmission Company (TRANSCO CLSG) through execution of International Treaty by the Heads of State and Government of the four (4#) countries, the hiring through an independent Recruitment Agency of staff of TRANSCO CLSG including its General Manager, and the execution of a Headquarters Agreement with the Government of Côte d'Ivoire together with Establishment Agreements with the Governments of Liberia, Sierra Leone and Guinea for the opening of national offices.

It is therefore on the basis of a strategic analyses of the lessons learnt from the 2012 – 2015 Business Plan and in cognizance of its status of implementation that the 2016 – 2019 Business Plan is formulated. Seeking to consolidate further the achievements of the



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preceding Plan and in a bid to accelerate the attainment of the WAPP vision, the 2016 – 2019 WAPP Business Plan is predicated on five (5#) Objectives:

- Update ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy;
- Implement WAPP Priority Projects;
- Establish a Regional Electricity Market;
- Implement the WAPP Dark Fibre Project;
- Enhance the effectiveness of the Secretariat workforce and augment organizational excellence

These Objectives are in recognition of the need to significantly augment the region's generation capacity with a diverse energy mix and an acceleration in the roll-out of the interconnections to integrate the remaining ECOWAS Member States. In addition, the Plan takes into account the transformation of the WAPP ICC into the independent RSMO together and the envisaged completion of the WAPP ICC Project by incorporating the necessary human and material resources to ensure its proper functionality upon commissioning. There is also a need to preserve the coherence and relevance of the Master Plan especially in light of the difficult situations faced by WAPP Member Utilities during the preceding Business Plan cycle that led to the pursuance of emergency national investments that shall ultimately have a bearing on the regional infrastructure program. In order to among others, improve efficiency and anticipate the advent of the regional electricity market, the capacities of WAPP Member Utilities shall continue to be reinforced to ensure their effective participation in the market. A key element to facilitate the capacity building is the development of WAPP Centers of Excellence within the region to leverage existing experiences. This Business Plan shall also aim to maximize benefits to be derived from utilization of its assets by moving forward with the deployment of an appropriate contractual framework to leverage the dark fibre on the transmission lines.

The Budget for the 2016 – 2019 WAPP Business Plan is estimated at US\$13,444,497,667 comprising US\$13,190,837,000 to cover the development of the Priority Projects, US\$157,793,000 to operationalise the ICC and implement the regional electricity market, US\$56,279,000 to implement the Capacity Building Program including the WAPP Centers of Excellence, and US\$39,588,667 for the Operating Budget of the WAPP Secretariat. For the Priority Projects, an amount of US\$7,046,151,000 has already been earmarked/secured from Partners and US\$4,671,000 is expected to be addressed by WAPP Member Utilities leaving a financing gap of US\$6,140,015,000 envisaged to be mobilised from Partners. With respect to the Capacity Building Program, US\$2,966,000 has already been earmarked/secured from Partners and US\$180,000 shall be from WAPP Member Utilities leaving a financing gap of US\$53,313,000 envisaged to be mobilised from Partners. A 5% Contingency provision on the estimated Budget implies that the financial resources required is US\$14,116,722,551.

The key outcomes of the 2016 – 2019 WAPP Business Plans shall include completion of the interconnection of all ECOWAS Member States by 2019, completion of the WAPP ICC in 2018 together with a formal deployment of the Regional Electricity Market.

## 2. CONTEXT OF THE WEST AFRICAN REGION

### 2.1. Growth

The Region of the Economic Community of West African States (ECOWAS) covers an area of over 5 million square kilometres with an estimated population of <sup>1</sup>335 million in 2014, representing approximately one-third of sub-Saharan Africa's total population. <sup>2</sup>Population size in 2014 ranged from approximately 1.909 million in The Gambia to 178.5 million in Nigeria, while Gross National Income per capita ranged from US\$ 430 in Niger to US\$3,520 in Cape Verde. <sup>3</sup>Despite a less than expected growth of 3.9% on the African Continent, the West Africa region sustained relatively high growth of 6% in 2014 despite the unfortunate health epidemic with Nigeria's growth of 6.3% coming mainly from non-oil sectors. As a result of the Ebola crisis and the drop in oil prices, growth is expected to marginally slow down to 5% in 2015 before rebounding to 6.1% in 2016, making West Africa the second most dynamic sub-region after East Africa.

### 2.2. The ECOWAS Treaty and Energy Protocol

Articles 3, 26, 28 and 55 of the ECOWAS Treaty specify the basic principles relating to promotion, cooperation, integration and development of the energy sector of the Member States of ECOWAS. The Authority of Heads of State and Government adopted in 1982, Decision A/DEC.3/5/82 relating to the energy policy of ECOWAS which aims at ensuring energy security, diversify primary energy sources and promote increased access to energy. With a view to among others augmenting investment in the energy sector and developing electricity energy trade within the West Africa region, ECOWAS formulated a sector specific reference text, the "ECOWAS Energy Protocol" that provided the legal framework for long term cooperation among ECOWAS Member States based on complementarity and mutual benefit. The provisions of the Protocol are designed, inter alia, to guarantee free exchange of energy, energy equipment and products between Member States. It is from this Protocol that the establishment of the West African Gas Pipeline, West African Power Pool (WAPP), ECOWAS Regional Electricity Regulatory Authority (ERERA) and ECOWAS Centre for Renewable Energy and Energy Efficiency is derived.

<sup>1</sup> Inafrica24.com, January 16, 2015

<sup>2</sup> World Bank

<sup>3</sup> 2015 African Economic Outlook



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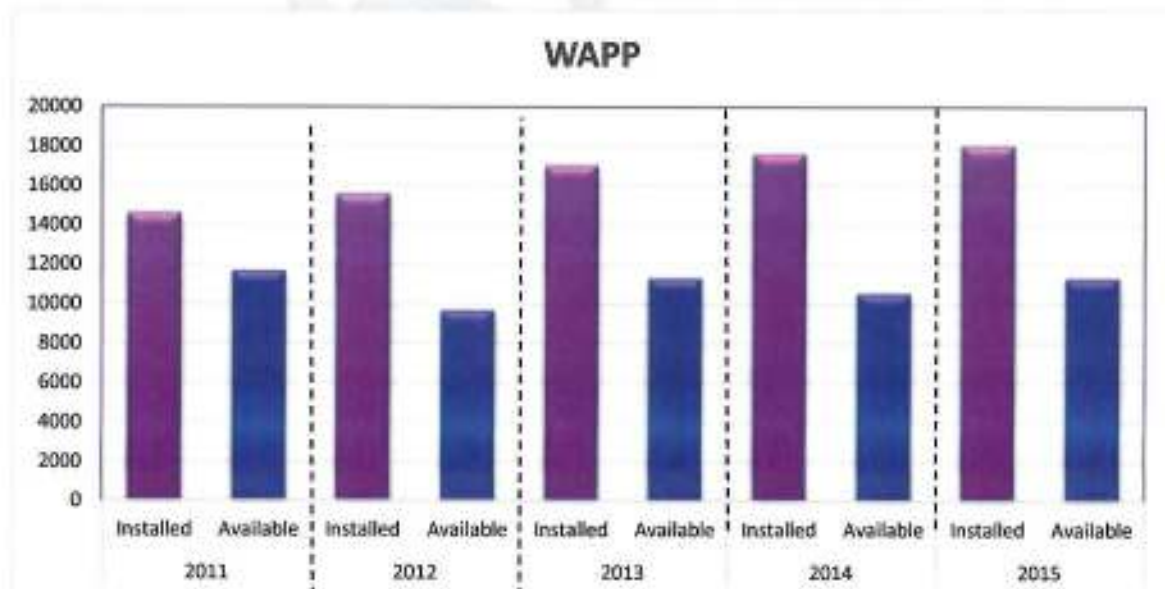
### 2.3. Regional Strategic Resources For Electricity Generation

The major energy resources available for electricity production in West Africa are crude oil, natural gas, hydropower, and on a smaller scale, coal and new Renewables. <sup>4</sup>As at 2012, Nigeria had the largest proven reserves of crude oil in West Africa estimated at 37.2 billion barrels followed by Ghana with approximately 0.660 billion barrels and Côte d'Ivoire with 0.1 billion barrels. With respect to natural gas, the proven Reserves at 2012 were Nigeria with 180.5 trillion cubic feet, Côte d'Ivoire with 1 trillion cubic feet and Ghana with 0.8 trillion cubic feet. The existence of several river basins has endowed the West Africa region with huge unexploited hydropower potentials estimated at 23,000 MW of which less than 20% has been exploited. Though significantly underutilised for power generation, coal Reserves (Total Recoverable Coal) in West Africa are estimated to be 287 Million Short Tons with approximately 210 located in Nigeria and the rest in Niger. The new Renewable technologies such as Solar Power and Wind Power have played limited role in the West African power sector but are slowly gaining attention, especially solar, as a result of sector reforms aimed at promoting investment and gradual decrease in cost disparity with more conventional power supply technologies.

### 2.4. Electricity Supply – Demand Imbalance

The paradoxical paradigm *"Energy in West Africa: Resource-full but not yet power-full"* continues to be valid despite the relative strong economic performance of the ECOWAS region. Despite the apparent prevalence of abundant resources even though unevenly distributed geographically, access to electricity is limited with only a significant minority of the population covered.

In addition, the WAPP ICC estimates that about 54% of the demand is being met through a significant disparity between installed and available capacities of power generation facilities.



<sup>4</sup> US Energy Information Administration (International Energy Statistics)

The imbalance in supply and demand can be attributed to factors that include Technical (Insufficient generating and transmission capacity, obsolete and unreliable equipment, Inadequate maintenance, inefficiencies in Operations, Non-availability of primary energy sources), Financial (Low user tariffs and collection rates, inadequate financial standing of utilities) and Institutional (planning & implementation responsibility, bureaucracy in decision-making, sensitivity of tariffs to low income/wage levels). During 2012 – 2015, inadequate rainfalls to feed the hydropower facilities as well as damage to the West African Gas Pipeline due to pirate activities contributed significantly to the mismatch between installed and available capacities.

## **2.5. Bridging the Electricity Supply – Demand Gap: “West African Power Pool”**

The sub-region's existing energy resources are more than enough to meet the overall energy needs but are unevenly distributed and under-developed. As a result, ECOWAS Member States were obliged to pursue national initiatives that were in some cases non-optimal in a bid to address power needs that were characterised by capital-intensive infrastructure. Faced with this power system development challenge, the highest decision making body of ECOWAS, the Authority of Heads of State and Government of Member States, authorized the establishment of the WAPP Organisation in 2006 through <sup>5</sup>Decision A/DEC.18/01/06 and <sup>6</sup>Decision A/DEC.20/01/06 with the expectation that the WAPP would represent a mechanism and institutional framework for integrating the national power systems of member countries into a regional electricity market that would help provide reliable and sustainable electricity supply for economic development.

The WAPP is a voluntary Organisation with Membership open to any entity, public or private, which: (a) own/operate generation facilities of 20 MW or larger, and /or distribute and retail electricity ; and/or (b) own/operate “major transmission facilities in the region”, if such facilities are physically interconnected and have an impact on coordination of system operations in the West Africa region (the “Transmission Owning/Operating Members”), or (c) have an interest in the electricity sector in the West Africa region but do not fit the definition of either the “Transmission Using Members” or “Transmission Owning/Operating Members” (the “Other Members”).

As at October 2015, the Members of WAPP were 26 (#) depicted as follows:

<sup>5</sup> Decision A/DEC.18/01/06 of the 29th Session of the Authority of the Heads of State and Government of ECOWAS held in Niamey on January 12th, 2006, adopting the Articles of Agreement relating to the establishment and functioning of the West African Power Pool (WAPP);

<sup>6</sup> Decision A/DEC.20/01/06 of the 29th Session of the Authority of the Heads of State and Government of ECOWAS held in Niamey on January 12th, 2006, granting the status of a Specialized Institution of ECOWAS to the West African Power Pool (WAPP);

## Members of WAPP as at 2015 (26#)



WAPP Member Utility			WAPP Member Utility		
1	CEB	Communauté Électrique du Bénin (Togo, Benin)	14	GTG	GTG Energy Limited (Ghana)
2	CEET	Compagnie Energie Electrique de Togo (Togo)	15	GTS	GTS Engineering Services (Ghana)
3	CENIT	CENIT Energy Limited (Ghana)	16	LEC	Liberia Electricity Corporation (Liberia)
4	CenPOWER	CenPOWER Generation Company Limited (Ghana)	17	Mainstream	Mainstream Energy Solutions Limited (Nigeria)
5	CIE	Compagnie Ivoirienne d'Electricité (Côte d'Ivoire)	18	NAWEC	National Water and Electricity Company Limited (The Gambia)
6	CI-ENERGIES	Société des Energies de Côte d'Ivoire (Côte d'Ivoire)	19	NIGELEC	Société Nigérienne d'Electricité (Niger)
7	ContourGlobal	Contour Global (Togo)	20	ONE	Office National de l'Electricité du Maroc (Morocco)
8	EAGB	Empresa Publica de Electricidade e Agua de Guine-Bissau (Guinea Bissau)	21	SBEE	Société Béninoise d'Energie Electrique (Benin)
9	ECG	Electricity Company of Ghana (Ghana)	22	Senelec	Société Nationale d'Electricité du Sénégal (Senegal)
10	EDG	Electricité de Guinée (Guinea)	23	SOGEM	Société de Gestion de l'Energie de Manantali (Mali, Senegal, Mauritania, Guinea)
11	EDM-SA	Energie du Mali-SA (Mali)	24	SONABEL	Société Nationale d'Electricité du Burkina (Burkina Faso)
12	EDSA	Electricity Distribution and Supply Company (Sierra Leone)	25	TCN	Transmission Company of Nigeria (Nigeria)
13	GRIDCo	Ghana Grid Company (Ghana)	26	VRA	Volta River Authority Ghana)

The vision of the WAPP is:

*"To integrate the national power systems into a unified regional electricity market with the expectation that such mechanism would over the medium to long term ensure citizens of ECOWAS Member States with a stable and reliable electricity supply at competitive costs"*

with a mission:

*"To promote and develop infrastructure, for power generation and transmission, as well as, to assure the coordination of electric power exchanges between ECOWAS Member States"*

The Organogram of WAPP, as indicated in Annex 1 reflects the following governance structure as prescribed in the WAPP Articles of Agreement:

#### **2.5.1. WAPP General Assembly**

The General Assembly is the highest decision making body of WAPP and comprises Representatives of all Member utilities of WAPP. The General Assembly is charged to among others:

- To observe the provisions assigned to it in accordance with the WAPP Articles of Agreement and the Membership Agreement.
- To facilitate in accordance with the provisions of the WAPP Articles of Agreement and the Membership Agreement, the co-ordination of appropriate measures towards the implementation of the principles of the WAPP Articles of Agreement.
- To engage the Members in accordance with the prescribed provisions in order to facilitate the implementation of programs and projects in the implementation framework of the Articles of Agreement.
- To approve the new applications for membership to the WAPP Articles of Agreement and any removal or re-instatement of a Member.
- To elect the members of the Executive Board.
- To examine and adopt the annual reports of the Executive Board.

#### **2.5.2. WAPP Executive Board**

The Executive Board is responsible for defining policies and monitoring the operations of the WAPP as well as the planning of its future development. The Board consists of eleven members, including the Secretary General. The elected representatives who serve on the Executive Board comprise Chief Executive Officers of the WAPP Member utilities. The Executive Board is charged to among others:

- Direct activities of all Organizational Committees;
- Examine and recommend to the General Assembly, the entry, exit and re-entry of Members to the WAPP Organization;

- Authorize all major contracts and [finance/debt] instruments;
- Select and review the performance of Officers, who shall serve at the pleasure of the Executive Board;
- Determine positions, duties, qualifications, salaries, benefits and other matters pertaining to the Officers and Staff;
- Review, approve, disapprove or recommend revision to the actions of any Organizational Committee;
- Approve or revise the operating and capital budgets and any additional expenditures of the WAPP structure;
- Convene the General Assembly at least annually;
- Recommend amendments to the Articles of Agreement for the Approval of the General Assembly;
- Recommend amendments to the Membership Agreement for the Approval of the General Assembly;
- Approve Guidelines pertaining to standards and policies of the WAPP Organization and penalties for non-compliance with such Guidelines; and
- Authorize filings with relevant regulatory bodies.

#### **2.5.3. WAPP Organisational Committees**

The WAPP Organisational Committees, comprising the Engineering and Operating Committee (EOC), the Strategic Planning and Environmental Committee (SPEC), the Finance Committee, (FC) Human Resources and Governance Committee (HRGC) and the Distribution and Commercialisation Committee (DCC), provide support and advice to the Executive Board on all matters concerning collective policy formulation functions for developing, maintaining and updating common “rules of practice” on technical, planning, operational and environmental aspects of WAPP. The Organisational Committees are composed of technical experts drawn from the WAPP Member Utilities. The Chairperson of any Organisational Committee may appoint Task Forces as necessary to carry out its mission. Task Force appointments under the auspices of any Organisational Committee is made with due consideration to the competence and expertise of the Members and their geographical location.

#### **2.5.4. WAPP Secretariat**

The WAPP Secretariat is the administrative organ to support the Executive Board in the accomplishment of the duties, and is also responsible for the day-to-day management of WAPP. The Secretariat has responsibility for the management and coordination of a team of independent professionals and a restricted number of permanent core staff responsible for implementing the day-to-day tasks required to accomplish the mission of WAPP. The staff of the WAPP Secretariat perform the secretarial function for all meetings of the permanent WAPP Committees and any ad hoc task force. Consultants are also recruited on a short term basis to strengthen the organizational capacities of the WAPP. The Secretariat is empowered to among others:

- (a) Employ qualified technical and administrative employees;
- (b) Engage office space;
- (c) Employ outside technical and professional service organizations;
- (d) Execute contracts;
- (e) Serve as the representative of the WAPP Organization to the Regional Power Regulatory Authorities other regulatory bodies of ECOWAS member states and in other public forums;
- (f) Incur reasonable expenses;
- (g) Make Staff resources available to individual Members or groups of Members on a non-discriminatory, timely and based on the principle of first-come-first-serve basis so as not to interfere with current or future needs and priorities established by the WAPP Organization. Staff members are required to make a declaration to adhere to the Code of Conduct upon employment, and annually thereafter. The Code of Conduct outlines the independence required of employees of the WAPP Organization.

The main Departments within the WAPP Secretariat, as reflected in the Organogram in Annex 1 are:

#### **2.5.4.1. Information & Coordination Center (ICC)**

The ICC is responsible for promoting operational coordination between Transmission Owning/Operating Members through actual day-to-day information sharing/exchange between the operational coordination centres of WAPP Members. Its responsibilities include:

- o Collect, analyse and disseminate information portraying overview of the state and evolution of the WAPP;
- o Monitor the evolution of the electricity situation in ECOWAS Member States with special focus on national power systems faced with emergency situations (in order to forewarn the risks of performance deficiencies and to provide them with corrective measures);
- o Periodically analyse the economic and technical potentials and feasibility of the electricity trading arrangements among Member State Utilities;
- o Facilitate the development of technical norms and standards for the efficient operation of the national and interconnected power networks;
- o Provide support for monitoring of the technical performances of power utilities;
- o Organization of periodic meetings of the EOC and the DCC.

The 7<sup>th</sup> Session of the WAPP General Assembly held in Abuja on November 2, 2012 approved through Decision WAPP/45/DEC.02/11/12 the transitioning of the WAPP ICC to the Regional System Market Operator.

#### **2.5.4.2. Administration & Finance (A&F) Department**

The role of the Finance & Administration Department is to strengthen the organizational structure of the WAPP and to manage the financial and accounting system of the WAPP Secretariat. Its activities focus on among others:

- Management of human resources at the WAPP Secretariat, from recruitment, integration, development of performance appraisal systems, training, right through to separation;
- Compilation of annual work programmes of the various departments and the Office of the Secretary General and preparation of the annual budget of the Secretariat;
- Preparation of periodic management accounts to monitor the performance of the various departments and office of Secretary General against their work programmes and budgets ;
- Publication of financial information in accordance with the provisions of the WAPP Financial and Accounting Manual and Financial Regulations;
- Preparation of year-end financial statements of the WAPP Secretariat and the projects, where such financing is controlled and managed by the WAPP Secretariat. These statements are audited by an independent external audit firm appointed by the WAPP Executive Board;
- Organise the external audit of the WAPP Secretariat by an External Auditor recruited through a competitive bidding process;
- Manage an integrated accounting and human resources management system;
- Development and implementation of capacity building programs for the staff of the WAPP Secretariat as well as Member Utilities;
- Organization of periodic meetings of the FC and the HRGC

#### **2.5.4.3. Planning, Investment Programming & Environmental Safeguards (PIPES) Department**

The implementation of priority investment programmes is coordinated by the WAPP Secretariat through the PIPES Department that ensures that the WAPP Priority Projects as defined in the approved ECOWAS Master Plans are developed. The responsibilities of the Department include:

- Prepare Terms of Reference, in conjunction with project teams from concerned countries, for project pre-investment studies and supervise the consultant selection process;
- Conduct, coordinate and monitor feasibility, technical, economic, financial and environmental/social impact studies of regional project interconnection lines and generation facilities ;
- Supervise the selection process for the Contractor to undertake the implementation of projects;



- Coordinate, supervise and review periodically the implementation of regional project interconnection lines and generation facilities;
- Conduct periodic reviews/updates of the ECOWAS Master Plan for the Generation and Transmission of Electrical Energy to preserve its coherence and relevance;
- Formulate periodic Business Plans to guide the outlook of the WAPP Organisation;
- Solicit and mobilize financing for projects and organise coordination meetings with relevant donors;
- Organise meetings of the Strategic Planning and Environmental Committee for the adoption of programmes and recommendations based on studies undertaken and provide support to the Committee in the accomplishment of its mission;

### 3. REVIEW OF THE PRIORITY GOALS DEFINED IN THE 2012 – 2015 WAPP BUSINESS PLAN

The primary objective of the 2012 – 2015 WAPP Business Plan was to set out a strategic guideline for the medium to long term development of the regional energy infrastructure as defined in the ECOWAS Revised Master Plan for the period 2012 -2025 and adopted by the ECOWAS Heads of State and Government through Supplementary Act A/SA.12/02/12. The Business Plan also set forth an Action Plan for the progressive roll-out of the regional electricity market.

The Business Plan had enunciated three (3) Priority Objectives:

- ❖ OBJECTIVE N° 1: *"Ensure effective and efficient implementation of WAPP Priority Projects as defined in the ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy (2012 – 2025)".*
- ❖ OBJECTIVE N° 2: *"Establish a Regional Electricity Market".*
- ❖ OBJECTIVE N° 3: *"Reinforce the Capacity Of WAPP".*

The implementation of the 2012 – 2015 WAPP Business Plan though was done in an environment fraught with challenges ranging from political instability in some ECOWAS Member States, pirate activities, to an unprecedented health-related epidemic that resulted in dire human and economic casualties both within and outside the region. In addition, the effects of the Global Financial Crisis were still being felt in the sub-region. Nonetheless, some progress was made towards the attainment of the Objectives.

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### 3.1. Realisations on Objective N° 1: "Ensure Effective and Efficient Implementation of WAPP Priority Projects"

The goal of this Objective was to significantly augment the level of integration of the WAPP interconnected system and augment the composition of low cost, clean energy generation sources in the energy mix. In particular, the Infrastructure Program that was highlighted in the 2012 – 2015 WAPP Business Plan sought to increase the number of interconnected systems, reinforce the capacities of existing interconnections and develop generation resources including hydropower.

#### 3.1.1. Progress Made on WAPP Priority Projects

The progress made on the projects that were in the Infrastructure Program of the 2012 – 2015 Business Plan is as follows:

- a. **330 kV Côte d'Ivoire - Ghana Interconnection Reinforcement Project:** The project is at the stage of financing mobilisation. Pre-investment studies funded by the EU-Africa Infrastructure Trust Fund (EU-A ITF) resulted in a feasibility study report being adopted by the concerned countries as well as the Financing Agencies. Similarly, the final ESIA reports for the Ghana component of the project were completed and an Environmental Permit issued by the Ghana Environmental Protection Agency. For the Côte d'Ivoire component, the process for Permitting was being concluded. Financing to completely cover the project cost has been earmarked from KfW and European Investment Bank (EIB). The two (2) concerned countries have commenced the process to secure financing from these Funding Agencies. Commissioning of the project is expected in 2019.
- b. **330 kV Volta (Ghana) – Lome "C" (Togo) – Sakete (Benin) Interconnection Project:** The project is under implementation and is being financed by the African Development Bank (AfDB), World Bank (WB), KfW and Banque Ouest Africain de Développement (BOAD). Construction works on the Ghana portion of the project were completed. For the Togo/Benin portion, the construction works were in progress and expected to be completed in 2017.
- c. **330 kV Nigeria – Benin Interconnection Reinforcement Project:** A Request For Funding was initially submitted to the New Partnership for Africa's Development - Infrastructure Project Preparation Facility (NEPAD-IPPF) of the AfDB in February 2013 to support the preparation of a Feasibility Study as well as an Environmental and Social Impact Assessment Study. An Appraisal Mission on the Request was subsequently carried out by the Bank in February 2014 in anticipation of funding approval. The Bank could however not process the Request in 2014 and made a deferment to 2015 following which a re-appraisal of the Request was conducted by the Bank in April 2015. Approval of funding is anticipated in the 2<sup>nd</sup> Semester of 2015. Commissioning of the project is expected in 2020.

- d. **760 kV Super-Grid in Nigeria:** The implementation strategy of the project is being reviewed by the Federal Government of Nigeria following the power sector re-structuring in 2012.
- e. **225 kV Bolgatanga (Ghana) - Ouagadougou (Burkina) Interconnection Project:** The project is under implementation and is being financed by the EIB, Agence Française de Développement (AFD) and WB. The recruitment of the Supervision Engineer, AECOM, was concluded and the procurement of Contractors for the works was subsequently launched. The project continues to be coordinated by a Joint Implementation Committee comprised of Ministries in charge of energy and national power utilities of the two concerned countries as well as the WAPP Secretariat. Commissioning of the project is expected in 2017.
- f. **225 kV Ghana - Burkina - Mali Interconnection Project:** The project is under preparation and complementary pre-investment studies funded by EU-A ITF through AFD and EIB are being finalised. In the meantime, AFD, EIB, WB, AfDB, BOAD, and Islamic Development Bank (IsDB) have confirmed their keen interest to participate in the financing of the project. Commissioning of the project is expected in 2020.
- g. **330 kV Aboadze – Prestea – Kumasi - Bolgatanga Transmission Line Project in Ghana:** The project is under preparation/implementation. Financing has already been secured from AFD to implement the Kumasi - Bolgatanga segment of the project and the recruitment of Contractors to do the works are in progress. The 330 kV Aboadze – Prestea - Kumasi legs are under negotiation by GRIDCo with Strategic Partners for their realisation. Expected commissioning of the 330 kV Kumasi – Bolgatanga segment is expected in 2018, whilst the 330 kV Aboadze – Prestea – Kumasi legs are expected in 2020.
- h. **225 kV Guinea – Mali Interconnection Project:** The project is under preparation and pre-investment studies funded by AfDB are being finalised. The final ESIA reports have been completed and respective Environmental Permits issued by the Agencies in charge of Environmental Protection in the two (2#) countries. The Donor consultation process to mobilise financing was begun and already the AfDB, KfW, EIB and IsDB have conveyed their keen interest to support the project. Commissioning of the project is expected in 2019.
- i. **330 kV Nigeria – Niger – Burkina – Togo/Benin Interconnection Project (Northcore):** The project is under preparation with funding from the NEPAD-IPPF and counterpart funding from the beneficiary utilities. The pre-investment studies were ongoing and expected to be completed in March 2016. Commissioning of the project is expected in 2020.
- j. **60 MW Felou Hydropower Project under OMVS (Senegal, Mali, Mauritania):** The project was commissioned in 2013 with financing from WB and EIB.

- k. **140 MW Gouina Hydropower Project under OMVS (Senegal, Mali, Mauritania):** The project is under implementation. Financing Agreements have been executed between OMVS Member States and China Exim Bank and the process is ongoing to meet effectiveness conditions. Commissioning of the project is expected in 2019.
- l. **OMVG Energy Project (Senegal, The Gambia, Guinea, Guinea Bissau):** The project involves the construction of the 240 MW Hydropower Facility at Kaleta, the 128 MW Hydropower Facility at Sambangalou and 225 kV Transmission line of length 1,677 km interconnecting 4 countries. The commissioning of the 240 MW Kaleta Hydropower Project that was financed by the Government of Guinea with support from China Eximbank was completed in 2015. The OMVG Member countries have submitted requests for financing to the China Eximbank for the realisation of the 128 MW Sambangalou Hydropower Facility. The AfDB, WB, EIB, AFD, KfW, IsDB, BOAD, and Kuwait Fund For Arab Economic Development have confirmed their interest to fund the transmission line and the procurement process has been launched. The Boards of Directors of IsDB, WB and AfDB approved in 2015, their components of the project financing. Commissioning of the 128 MW Hydropower Facility at Sambangalou is expected in 2020 and the 225 kV Transmission line in 2019.
- m. **225 kV Côte d'Ivoire – Liberia – Sierra Leone – Guinea (CLSG) Interconnection Project:** The project, financed by AfDB, WB, EIB and KfW, is being implemented through a Special Purpose Company called TRANSCO CLSG owned by the four concerned national power utilities and with its own Board of Directors. The creation of the Company was through International Treaty executed by the Heads of State and Government of the four (4) concerned countries. The establishment of the Company was through a Shareholders Agreement executed among the four (4) national utilities together with Articles of Agreement as well as a Headquarters Agreement between TRANSCO CLSG and the Government of Côte d'Ivoire. The process to execute Establishment Agreements for the opening of national offices in Liberia, Sierra Leone and Guinea was ongoing. The implementation of the project is governed by an International Project Agreement between TRANSCO CLSG and the four countries with their Ministers in charge of energy having oversight through a Steering Committee. The staff of the Company, including a Project Implementation Unit, were hired through International Competitive Bidding with the support of an independent Recruitment Agency. The Owners Engineer Phase 1 has been recruited and is supporting TRANSCO CLSG with the procurement process for the works. The commercial framework (Power Purchase Agreement (PPA), Transmission Service Agreement (TSA)) for the project is being finalised. Commissioning of the project is expected in 2018.

- n. **64 MW Mount Coffee Hydropower Project in Liberia:** The project is under implementation and is being financed by KfW, EIB, Government of Norway, and Millennium Challenge Corporation. Commissioning of the project is expected in 2017.
- o. **128 MW Kassa 'B' Hydropower Project in Guinea:** The project requires pre-investment studies to establish its techno-economic viability as well as environmental and social impacts. Funding was mobilised from the WB to prepare pre-investment studies. However, the Government of Guinea was re-assessing its strategy for implementing the project.
- p. **86 MW Bikongor Hydropower Project in Sierra Leone:** The project requires pre-investment studies to establish its techno-economic viability as well as environmental and social impacts. Funding was mobilised from the WB to prepare pre-investment studies. However, the Government of Sierra Leone was re-assessing its strategy for implementing the project.
- q. **450 MW WAPP Maria Gleta Regional Power Generation Facility in Benin:** The project is under implementation within the framework of a public-private partnership. A new Joint Development Agreement (JDA) was executed with the Africa Finance Corporation (AFC) and the update of pre-investment studies was launched. Commissioning of the project is expected in 2020.
- r. **450 MW WAPP Domunli Regional Power Generation Facility in Ghana:** The project is under implementation within the framework of a public-private partnership. A new JDA was executed with the AFC and the update of pre-investment studies was launched. The process to finalise the land allocation to WAPP was also ongoing. Commissioning of the project is expected in 2020.
- s. **150 - 450 MW WAPP Regional Power Generation Facility within OMVS Zone (Senegal, Mali, Mauritania, Guinea):** The project is envisaged to be implemented within the framework of a public-private partnership and is still at the conceptual level due to constraints in securing land for its realisation. Consultation meetings were held with Government of Senegal to resolve this challenge.
- t. **147 MW Adjarala Hydropower Project (Benin, Togo):** The project is under negotiations for financing. The update of pre-investment studies was concluded by CEB and an Environmental Permit issued for the project. Requests for financing were submitted by the Governments of Togo and Benin to China Exim-Bank for consideration. The Bank subsequently conducted Appraisal Missions and continued evaluating the Requests. Commissioning of the project is expected in 2019.

- u. **Rehabilitation of 760 MW Kainji and 540 MW Jebba Hydropower Facilities in Nigeria:** The project is under implementation with financing from the World Bank and the works are expected to be completed in early 2016. As part of the electricity sub-sector re-structuring in Nigeria, the two (2) facilities are now being managed by the private sector, Mainstream Energy Solutions Limited, a Member of WAPP.
- v. **515 MW Souapiti Hydropower Project in Guinea:** The project is under preparation with funding from the World Bank and entails a Feasibility Study Update and Determination of Best Option to develop the project under the framework of a Public-Private Partnership (PPP). The study is expected to be completed in February 2016 and commissioning of the project is envisaged in 2021.
- w. **30 MW Solar Power Park in Mali:** The project was under preparation and a pre-feasibility study already prepared with funding from European Union (EU). The Government of Mali was however re-assessing its strategy for implementing the project.
- x. **220 MW Tiboto Hydropower Project (Côte d'Ivoire, Liberia):** The project is under implementation by the Government of Côte d'Ivoire. A Consultation framework was being established among the Governments of Côte d'Ivoire and Liberia with WAPP for a good coordination on the development of the project. Commissioning of the project is expected in 2021.
- y. **Ghana – Burkina Faso, Ghana – Togo, and Côte d'Ivoire – Liberia Medium Voltage Cross Border Electrification Projects:** The implementation of the projects was funded by the ACP EU 1<sup>st</sup> Energy Facility with counterpart funding from the concerned national power utilities. The Ghana – Togo Project was commissioned in 2010, Ghana - Burkina Faso Project in 2012, and the Côte d'Ivoire – Liberia in 2015. The Defects Liability Period for Côte d'Ivoire – Liberia Project shall conclude in 2016.
- z. **Ghana – Southern Togo and Benin - Northern Togo Medium Voltage Cross Border Electrification Projects:** The implementation of the projects was funded by the ACP EU 2<sup>nd</sup> Energy Facility with counterpart funding from the concerned national power utilities. The Ghana – Southern Togo project was commissioned in 2014 and the Benin – Northern Togo Project commissioned in 2015. The Defects Liability Period for Benin – Northern Togo Project shall conclude in 2016.

In addition to these projects, the WAPP, with support from the United Nations Environment Programme and the African Carbon Asset Development (ACAD) Facility together with the United Nations Framework Convention on Climate Change developed a regional Grid Emission Factor (GEF) for the interconnected system. The GEF was validated by the Designated National Authorities in each of the ECOWAS Member States.

### 3.1.2. Evaluation on the Achievement of Objective N° 1.

The Table below attempts to present the level of achievement realised on the Priority Projects as was envisaged in the 2012 – 2015 Business Plan:

Projects in 2012-2015 Business Plan whose *Preparation* should have been completed within 2012-2015:

Status		2012 to 2015		2015 Completion	Challenges Encountered
1	330 kV Riviera (Cote d'Ivoire) - Prestea (Ghana) Interconnection Reinforcement Project;	Feasibility Study and ESIA Study completed and Environmental Permit issued in Ghana. Financing to cover complete project cost earmarked by EIB and KfW.		100	
2	225 kV Ghana - Burkina Faso - Mali - Interconnection Project;	Complementary pre-investment studies (Feasibility, ESIA, Institutional, Commercial Framework, Bidding Documents) were in progress.		85	Relocation of Off-take Substation in Ghana from Bolgatanga to Nyagbia delayed kick-off of complementary studies
3	225 kV Cote d'Ivoire - Liberia - Sierra Leone - Guinea Interconnection Project	Pre-investment Studies (Feasibility, ESIA, Institutional, Commercial Framework, Bidding Documents) were completed and financing was completely secured from AfDB, WB, EIB, and KfW.		100	
4	225 kV Guinea - Mali Interconnection Project	Feasibility Study and ESIA Study completed and Environmental Permits issued. Process to mobilise financing to implement project was ongoing.		100	
5	450 MW WAPP Maria Gleti (Benin) Regional Power Generation Facility;	Update of Pre-investment Studies were in progress by new Strategic Partner.		30	The preferred Strategic Partner from the recruitment process backed out of the project and WAPP had to enter and conclude negotiations with the second Preferred Bidder.
6	450 MW WAPP Abiodun/Domunli (Ghana) Regional Power Generation Facility;	Pre-investment Studies were in progress by new Strategic Partner.		30	The preferred Strategic Partner from the recruitment process backed out of the project and WAPP had to enter and conclude negotiations with the second Preferred Bidder.
7	330 kV WAPP Northore Interconnection Project (Nigeria, Niger, Burkina, Togo/Benin)	Update of Pre-investment Studies (Feasibility, ESIA, Institutional, Commercial Framework, Bidding Documents) were in progress.		30	Delay in securing funding from NEPAD-IPPF to update pre-investment studies.
8	330 kV Nigeria - Benin Interconnection Reinforcement Project;	Recruitment of Consultants was in progress to prepare pre-investment studies.		30	Delays in securing funding to do pre-investment studies. Negotiations very advanced with NEPAD-IPPF to secure funding.
9	Integration of power systems of Senegal and NAWEC (OMVG Energy Project)	Preparation of OMVG project was completed and partial financing of project cost secured from IsDB, WB and AfDB.		100	
10	64 MW Mount Coffee Hydropower Project in Liberia	Pre-investment studies were completed and financing was completely secured from EIB, KfW, Government of Norway and Millennium Challenge Corporation.		100	
11	515 MW Souapiti Hydropower Project in Guinea	Feasibility Study was in progress as well as ESIA.		30	Delays in the commencement of the study due to Ebola epidemic.
12	220 MW Tiboto Hydropower Project (Cote d'Ivoire, Liberia);	Project was under development by the Government of Cote d'Ivoire.		35	Delays in mobilising funding by WAPP to prepare pre-investment studies.
13	Development of WAPP Grid Emission Factor	Regional GEF for interconnected systems endorsed by National Designated Authorities of ECOWAS Member States.		100	
Aggregate Average Completion				69	



Projects in 2012-2015 Business Plan whose **Implementation** should have been completed within 2012 - 2015:

	Project	Status by end 2015	% Completion	Challenges Encountered
1	330 kV Volta (Ghana) - Lome 'C' (Togo) - Sakete (Benin) Interconnection Project;	Financing was secured from AfDB, WB, BOAD and KfW. Ghana portion of works completed. Works in Togo/Benin were well-advanced	80	Delays in the implementation were realised as a result of among others, delays in completing financing for the Togo/Benin part of the project and finalisation of the compensation for PAPs
2	225 kV Bolgatanga (Ghana) - Ouagadougou (Burkina Faso) Interconnection Project;	Financing was secured from EIB, AFD, and WB. Recruitment of Supervision Engineer was concluded and Procurement of Contractors was in progress.	65	Relocation of Off-take Substation in Ghana from Bolgatanga to Nyagula delayed launch of works procurement
3	330 kV Aboadze (Ghana) - Prestea (Ghana) - Bolgatanga (Ghana) Transmission Line Project;	Financing secured from AFD for 330 kV Kumasi - Bolgatanga segment and recruitment of Contractors was in progress. The 330 kV Aboadze - Prestea - Kumasi legs were under negotiation by GRIDCO with Strategic Partners for their realisation	70	Relocation of Off-take Substation in Ghana from Bolgatanga to Nyagula delayed launch of works procurement
4	161 kV Tumu (Ghana) - Han (Ghana) - Wa (Ghana) Transmission Line Project;	Works were almost completed at all sites and expected to be commissioned in early 2016	95	
5	60 MW Felou Hydropower Project under OMVS	Facility was operational	100	
6	64 MW Mount Coffee Hydropower Project in Liberia	Financing was completely secured from EIB, KfW, Government of Norway and Millennium Challenge Corporation. Procurement of Contractors completed and works were in progress	60	Delays in the procurement and launching of works due to Ebola epidemic
7	Rehabilitation of 760 MW Kainji and 578 MW Jebba Dams;	Works are expected to be completed by end 2015. As part of the electricity sub-sector re-structuring in Nigeria, the two (2) facilities are now being managed by the private sector	95	
8	Ghana - Southern Togo Medium Voltage Cross Border Project	Facilities were operational	100	
9	Benin - Northern Togo Medium Voltage Cross Border Project	Facilities were operational	100	
10	Cote d'Ivoire - Liberia Medium Voltage Cross Border Project	Facilities were operational	100	
11	OMVG Energy Project: 240 MW Kalaia Hydropower Facility	Facility was operational	100	
12	400 MW Bai Hydropower Project;	Facility was operational	100	
Aggregate Average Completion			89	



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The development of the following projects could not continue primarily due to reviews by the respective Governments of the project implementation strategies:

	Project	Challenges Encountered
1	150 - 450 MW WAPP Regional Power Generation Facility within OMVS Zone;	Land could not be secured from the Government of Senegal to prepare the project
2	128 MW Kassa 'B' Hydropower Project in Guinea	Progress could not be made due to an ongoing re-evaluation of the project implementation strategy by the Government of Guinea
3	86 MW Bikongor Hydropower Project in Sierra Leone;	Progress could not be made due to an ongoing re-evaluation of the project implementation strategy by the Government of Sierra Leone
4	30 MW WAPP Solar Power Park in Mali	Further progress could not be made due to an ongoing re-evaluation of the project implementation strategy by the Government of Mali

### 3.2. Realisations on Objective N° 2: "Establish a Regional Electricity Market"

The goal of this Objective was to develop the mechanism that would coordinate and facilitate cross-border trading as well as power exchanges among ECOWAS Members States. The WAPP General Assembly approved the transformation of the WAPP ICC to Regional System Market Operator is the institution to actualize the market in 2012.

#### 3.2.1. Progress Made on Developing the Regional Electricity Market

With regard to the establishment of the Regional Electricity Market, the Objective was sub-divided into a number of sub-Objectives as follows:

- a. **Implementation of the Regional Electricity Market Road Map:** The Market Rules, Market Design and Market Road Map were developed in 2012 by Mecardos (Spain). The Market Implementation Road Map of the Market Design is in three phases; Phase 1 is the preparatory phase and involves the Regulator (ERERA) putting in place an operative dispute resolution procedure, charging an institution with the task of regional operation and commercial coordination, internalizing contracts and procedures defined at regional level, standardization of contracts and trading, definition of market participants, roles of TSOs among others. Phase 2 is when an institution with a Regional Market Operator function has been established to coordinating trade through bilateral contracts, operation of day-ahead market, and management of the regional market among others. Phase 3 is defined as the final market phase. This is when the region enough generation and transmission capacity, dynamic bilateral and day-ahead markets, ancillary services market, enforceable regional transmission plans, a competitive market with low risk of exercising market power. The activities in Phase 1 are being implemented and the following has been achieved (i) WAPP-ICC has been



designated as the Regional Market Operator to implement the Market Road Map, (ii) the Owners Engineers for the WAPP-ICC Infrastructural Project have been engaged, (iii) additional ICC staff have been employed to reinforce the capacity of the RSMO, (iii) the Architectural Design of the has been adopted by the General Assembly (iv) the Technical Specification have been adopted by the Engineering Operation Committee (EOC), (v) the Market Contract has been developed, (vi) capacity building program was provided for ICC staff and Control Area Center (CAC) staff on the principle of large power pool and (vi) the Perimeter Wall has been constructed. Recruitment of additional staff and capacity building are ongoing.

- b. **Implementation of WAPP ICC Infrastructure Project:** The project will provide the WAPP Information and Coordination Center (ICC) the means to assume its role of among others, the Market Operator. The ICC Project involves the construction of the ICC building in Calavi (Republic of Benin), well equipped with among others, SCADA/EMS and Decision Support Systems. The WAPP Secretariat mobilized a €30 million grant from the European Union (EU) to implement the WAPP ICC Project which is expected to be completed in 2018. The Consortium, AETS-EDF-RTE are the Owners' Engineers undertaking the design, preparation of tender dossier and supervising the implementation of the WAPP ICC Project.
- c. **Implementation of the WAPP Operations Manual:** The WAPP Operations Manual comprises of a list of technical policies designed to ensure a coordinated operation of WAPP Interconnected Power Systems in a secure and reliable manner. Within the framework of implementing the Operations Manual, the WAPP Secretariat secured a US\$21.5 million Grant from the World Bank for the Synchronization of WAPP Interconnected Power Systems. The Synchronisation Project consists of two (2#) phases:
  - Phase 1 of the project involves preparation of studies and network analyses as well as the recommendation of relevant equipment to be installed to ensure a successful synchronization;
  - Phase 2 is related to supervision of the supply, installation and commissioning of the recommended equipment.

The Consortium, Lahmeyer / CESI is the Study Consultant and Owners Engineer for the project. The project is expected to be completed end December 2018.
- d. **Establishment of RSMO Database Website:** All data collected from all ongoing projects including the WAPP GIS is consolidated in the RSMO Database with EU Technical Assistant. The Regional Energy Database in collaboration with the ECREE will be developed by USAID.
- e. **Establishment of WAPP Geographical Information System (GIS):** The Geographical Information System for all WAPP Utilities has been developed based on QGIS software with support of EU Technical Assistant. The output of the project are creation of WAPP GIS database, Regional GIS Map and Country

GIS Maps. The ICC staff and Utility staff have been trained on the QGIS Software and each Utility validated the GIS database and Country GIS Maps. A GIS Training Manual and a Harmonized GIS Manual in English and French have been developed. The WAPP GIS database, Regional GIS Map and Country GIS Maps will be updated periodically as recommended in the harmonized GIS Manual.

- f. **RSMO Certification Program:** The RSMO certification program will be developed to certify pool operators and engineers. Regional certification courses to be accredited by reputable institutions be developed.
- g. **Implementation of the WAPP Dark Fibre Project:** As an opportunity for WAPP member utilities to recoup part of their capital expenditures and offset part of their operating costs, the WAPP through the support of the World Bank launch a study on the feasible for member utilities to establish a leasing program for excess dark fibre capacity on the WAPP transmission lines. The WAPP has adopted a Dark Fibre leasing model and developed a Consortium Agreement which has been reviewed by the Legal Experts from concerned WAPP Member Utilities and subsequently adopted by the 28th Meeting of the WAPP Executive Board. Arrangements are ongoing for the execution of the Consortium Agreement by the involved WAPP Member Utilities.
- h. **Market Reports:** The WAPP Monitoring & Evaluation (M&E) capacity was strengthen with the support of the World Bank grant. The M&E Framework and M&E Manual was developed for the WAPP member utilities. The review of the M&E Framework and M&E Manual is envisaged to be completed by December 2015. Various Market Reports will be produced using Business Intelligence tools.

### 3.2.2. Evaluation on the Achievement of Objective N° 2.

The Table below attempts to present the level of achievement realised on the Establishment of the Regional Electricity Market as was foreseen in the 2012 – 2015 Business Plan:

	Project name	Status by end 2015	% completion	Challenges
3.1	Implementation of the Regional Electricity Market Road Map	<ul style="list-style-type: none"> <li>- Launch recruitment of four additional staff</li> <li>- Bilateral Contract Taskforce adopts standardized contracts</li> </ul>	50%	Dissemination of Road Map to stakeholders
3.2	Implementation of WAPP-ICC Infrastructure Project.	<ul style="list-style-type: none"> <li>- AETS/EDF consortium the Owner Engineers.</li> <li>- Architectural Building Design and Technical Specifications for equipment approved</li> <li>- Bidding Document for construction of the ICC building launched and evaluated.</li> </ul>	45%	
3.3	Implementation of the WAPP Operational Manual	<ul style="list-style-type: none"> <li>- Synchronisation Preliminary studies submitted</li> <li>- Field Test at seven Generation Stations</li> </ul>	50%	Delay in implementation of project
3.4	Establishment of RSMO Database and Website	<ul style="list-style-type: none"> <li>- TOR developed for RSMO Website</li> <li>- TOR for RSMO Database structure developed</li> </ul>	20%	Coordination of ECREE and WAPP-ICC
3.5	Establishment of WAPP Geographical Information System WAPP-GIS	<ul style="list-style-type: none"> <li>- Country GIS Maps validated</li> <li>- GIS Database updated</li> <li>- QGIS Training conducted for ICC &amp; Utility Staff</li> <li>- Harmonized GIS Manual developed</li> </ul>	85%	Constant update of GIS Database and Maps



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	Project name	Status by end 2015	% completion	Challenges
3.6	RSMO Certification Program		5%	Secure accreditation with NERC or similar agency
3.7	Implementation of the WAPP Dark Fibre Project	WAPP Dark Fibre Consortium Agreement approved by the WAPP Executive Board. Consortium Agreement signed by five foundation member - M&E Framework and M&E - Manual reviewed Market Report published	35%	Ownership by stakeholders of the Dark Fibre
3.8	Market Reporting		80%	Non-availability of data on time



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### 3.3. Realisations on Objective N° 3: "Reinforce the Capacity Of WAPP"

The goal of this Objective was to ensure that the WAPP Secretariat and Member Utilities possessed the necessary competencies to implement the required activities for the attainment of the WAPP vision.

#### 3.3.1. Progress Made on Reinforcing the Capacity of WAPP

During the period 2012-2015, the WAPP Secretariat in collaboration with Member Utilities and support from Partners, undertook capacity reinforcement activities that included the following:

- a. **Reinforcement of Staff Complement at WAPP Secretariat with Seconded Staff:** The WAPP Secretariat, with support from USAID, continued the practise of relying on seconded experts from Member Utilities to augment its staff complement for the implementation of finite-duration activities. The following table recapitulates the seconded staff that the WAPP Secretariat has benefitted from during the last Business Planning cycle:

#	Function within WAPP Secretariat	Utility	Start of Secondment	End of Secondment
1	Project Coordinator, PIPES	EDG	June 2010	Ongoing
2	Project Coordinator, PIPES	VRA	June 2010	Ongoing
3	Project Coordinator, PIPES	ECG	April 2011	July 2014
4	Human Resources Officer	PHCN	September 2012	April 2013

- b. **Reinforcement of Staff Complement at WAPP Secretariat with Resident Experts (Individual Consultants):** With support from its Partners and its own resources, the WAPP Secretariat recruited Resident Experts to provide support in specific areas or activities. The following summarises the Resident Experts that WAPP Secretariat benefitted from during 2012 - 2015:

#	Function within WAPP Secretariat	Funding Source	Commencement	Duration of Contract (yrs)
1	Project Coordinator for MV Cross Border Projects	WAPP	2013	3
2	Project Administrator	WAPP	2012	4
3	Communication Officer	WAPP	2012	3

4	Procurement Officer	AfDB	2015	3
6	Environmental and Safeguards Expert	AfDB	2015	3
7	Advisor on Public-Private Partnerships	USAID	2015	3
8	Power Pool Advisor	WB	2015	3
9	Resident Experts (3#) for ECOWAS Emergency Program in Guinea	ECOWAS	2011	1
10	Resident Expert (1#) for ECOWAS Emergency Program in Mali	ECOWAS	2014	2
11	Resident Expert (1#) for ECOWAS Emergency Program in The Gambia	ECOWAS	2014	1
12	Resident Expert (1#) for ECOWAS Emergency Program in Sierra Leone	ECOWAS	2014	2

- c. **Reinforcement of Staff Complement at WAPP Secretariat with Donor-funded Resident Technical Assistance:** With support from EU, the WAPP Secretariat benefitted from a resident Technical Assistance that also could call upon short term experts to implement specific tasks. In 2012, the AETS concluded its WAPP Technical Assistance residency and this was assumed in 2013 by Tractebel Engineering to date.
- d. **Training of Staff from WAPP Secretariat and Member Utilities:** During the period under review, staff from both the WAPP Secretariat and Member Utilities as well as Ministries in charge of energy and national Regulatory Authorities benefitted from diverse training programs aimed at augmenting their capacities indicated as follows:

#	Training	Participants (#)	Date and Location	Funding Source
1	Session (1#) on Disbursement Procedures of USAID	3 staff of WAPP Secretariat	Cotonou, July 2012	USAID
2	Session (1#) on Financial Procedures of USAID	1 staff of WAPP Secretariat	Abidjan, September 2012	USAID
3	Workshop (1#) on International Public Sector Accounting Standards	6 WAPP Finance Committee Members & 4 staff WAPP Secretariat	Dakar, November 2012	USAID
4	Session (1#) on Revenue Management by Electricity Utilities (Commercial Losses and Revenue Collection)	23 officers from WAPP Member Utilities	Accra, December 2012	USAID

#	Training	Participants (#)	Date and Location	Funding Source
5	Workshop (1#) on Governance of Electricity Sub-sector	25 officers (Ministries in charge of energy, Regulatory Authorities, Member Utilities, WAPP Secretariat)	Abidjan, February 2013	USAID
6	Session (1#) on Planning, Operation and Maintenance of electricity systems	26 technicians from EDM-SA (Mali), NIGELEC (Niger) and SONABEL (Burkina Faso)	Dakar, April-May 2013	USAID
7	Session (1#) on Procurement Procedures of World Bank	5 staff of WAPP Secretariat	Cotonou, May 2013	World Bank
8	Session (1#) on Monitoring and Evaluation	5 Staff of WAPP Secretariat	Cotonou, July 2013	ECOWAS Commission / GIZ
9	Session (1#) on Document Filing and Archiving for Administrative Assistants and Secretaries at the WAPP Secretariat	8 Staff of WAPP Secretariat	Porto Novo, December 2013	WAPP
10	Workshop (1#) on Technical and Commercial Losses	15 Staff from Utility Members	Lagos, September 2014	USAID/ USEA
11	Sessions (2#) on Preventive Driving for Drivers from WAPP Secretariat	11 Staff of WAPP Secretariat	Lomé, December 2014	WAPP
12	Session (1#) on Advanced Functions of Microsoft Office for Administrative Assistants and Secretaries at the WAPP Secretariat	8 Staff of WAPP Secretariat	Porto Novo, December 2014	WAPP
13	Session (1#) on utilisation of the stock management software "Sun System"	5 Staff of WAPP Secretariat	Lagos, January 2015	WAPP
14	Session (1#) on project preparation, analysis and financing	1 Staff of WAPP Secretariat	Washington, USA, March-April 2015	WAPP
15	Session (1#) on English translation and interpretation	1 Staff of WAPP Secretariat	Ghana September 2014- February 2015	WAPP/ GIZ
16	Session (1#) on administration and logistics management	1 Staff of WAPP Secretariat	Morocco May-August 2015	WAPP/ GIZ
17	Session (1#) on supply, procurement & Contracts	1 Staff of WAPP Secretariat	Côte d'Ivoire May-July 2015	WAPP/ GIZ

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#	Training	Participants (#)	Date and Location	Funding Source
18	Educational Visit (1#) of Power Pools in Central and West Europe	20 from WAPP ICC and CACs	Austria, Germany, Belgium, France, Czech Republic April-May 2015	USAID
19	Leadership, Management and Negotiation in International Organizations	1 Staff of WAPP Secretariat	USA, September 2015	AfDB
20	Sessions (2#) on Management of Projects	10 from WAPP ICC	Morocco, Tanzania October 2015	GIZ
21	Sessions (2#) on Electricity Market Business Process	11 from WAPP ICC	France December 2015	GIZ
22	Session (1#) on Public Private Partnerships	15 Members of SPEC	Senegal December 2015	USAID
23	Session (1#) on Public Private Partnerships	25 Members of EOC	Senegal December 2015	USAID
24	Session (1#) on financial risk analysis	3 Staff of WAPP Secretariat	USA December 2015	AfDB
25	Session (1#) on Mediation and Arbitration	1 Staff of WAPP Secretariat	USA December 2015	AfDB
26	Session (1#) on Governance and anti-corruption practices	Staff of WAPP Secretariat	USA December 2015	AfDB

- e. **Development of Centers of Excellence:** During the period, the WAPP commenced preparatory activities towards the creation of WAPP regional training centers primarily through the upgrade of existing utility training facilities to meet the region's needs. These included:

#	Activities	Funding Source
1	Business Plan for WAPP Center of Excellence at Akuse (Ghana)	VRA, GRIDCo, ECG, WAPP
2	Business Plan for WAPP Center of Excellence at Cap des Biches (Senelec, Senegal)	USAID, GIZ
3	Business Plan for WAPP Center of Excellence at Calavi (CEB, Benin -Togo)	USAID, GIZ

- f. **Reinforcement of WAPP Governance Framework:** During the period, the WAPP also took steps to reinforce its framework documents by formulating a Gender Equality Policy, elaborating a Manual of Administrative, Accounting and Financial Procedures as well as launching the update of the WAPP Capacity Building Program Initiative (CBPI).

#	Activities	Funding Source
1	Update of WAPP Capacity Building Program Initiative	USAID
2	Elaboration of WAPP Gender Equality Policy	USAID
3	Elaboration WAPP Manual of Administrative, Accounting and Financial Procedures	USAID

### 3.3.2. Evaluation on the Achievement of Objective N° 3.

Although a significant number of training programs were implemented during the period, not all the areas identified in the preceding Business Plan could be covered and this can be attributed to the following among others:

- Epidemic:** Capacity building activities were suspended in 2014 due to the Ebola crisis within the sub-region;
- Constraints of the WAPP Annual Budgets:** The WAPP operating and capital budgets are contributed by WAPP Members who all faced financial difficulties during the period 2012 – 2016 and could not afford increases in their contributions to WAPP. Hence it was extremely difficult to substantially increase training budgets;
- Delay in implementation of training programmes:** Delays in disbursements on donor-funded activities that affected the commencement of programmes.
- Consultancy Challenges:** Delay in the update of the CBPI due to problems with Consultant and therefore unable to mobilise resources for training.

### 3.4. Energy Efficiency Programs for WAPP Member Utilities

The main goal of this Objective, though not distinctly specified in the 2012 – 2015 WAPP Business Plan, was to improve the technical performance, reliability, maintainability, electricity access and financial viability of WAPP Distribution utilities.

#### 3.4.1. Progress made on Developing Energy Efficiency Programs for WAPP Member Utilities

This Objective was sub-divided into a number of sub-Objectives as follows:

- Distribution Investment Development and Loss Reduction Program:** Within the framework of the Program "Promoting a climate-friendly WAPP Interconnected Power System" funded by the German Cooperation with the technical assistance of GIZ, the WAPP Secretariat secured funding to recruit a Consultant to prepare the Distribution Investment Development and Loss

Reduction Program for WAPP Member Utilities. The Program has four (4#) main specific goals:

- ❖ **Energy Efficiency Improvement:** Improve energy efficiency within the sub-region thereby reducing peak demand through the deployment of measures such as the use of energy conservation (e. use of energy efficient bulbs), demand side management etc.
- ❖ **Distribution System Loss Reduction:** To significantly reduce distribution system losses to about 10-12% close to international best practices.
- ❖ **Improvement in Revenue Collection:** Improve revenue collection to above 98% and above through the deployment of efficient metering systems.
- ❖ **Electricity Access:** Increase access to electricity up to 80% for all households.

The Consultant, GOPA – Intec was recruited to undertake the feasibility study under which the following toolkits are expected to be developed:

- Toolkit for Distribution Loss Reduction
- Toolkit to Increase Electricity Access
- Bankable projects (documents) to improve power supply, technical performance and financial viability of distribution utilities.

Two project clarification meetings were organized in Accra and Ouagadougou in September 2015. The meetings involved discussions on the methodology and approach for the study, and the collection of data of distribution utilities to undertake the study. The studies are expected to be completed in 2016.

## II. **Smart Grid Applications in Distribution Systems of WAPP Member Utilities:**

The primary goal of this sub-objective is to improve the reliability and maintainability of WAPP distribution networks as well as distribution business within the sub region. The project would be in two (2#) Phases:

- ❖ **Phase 1:** Undertake a feasibility study on smart grid applications on distribution systems of WAPP member countries. Development of a Road map for the implementation of smart grid technology.
- ❖ **Phase 2:** Development of bankable projects to implement smart grid applications.

WAPP will develop bankable projects to: (i) Automate remote monitoring the operations of WAPP Distribution Utilities, (ii) Automate Prepaid metering process

### 3.4.2. Evaluation on the Achievement of Developing Energy Efficiency Programs for WAPP Member Utilities

The Table below attempts to present the level of achievement realised:

	Project name	Status by end 2015	% completion	Challenges
	WAPP Distribution Utilities Investment Development Projects	- Distribution loss reduction studies in progress. Output to be used as input into financial status of companies	10%	Accurate data collection

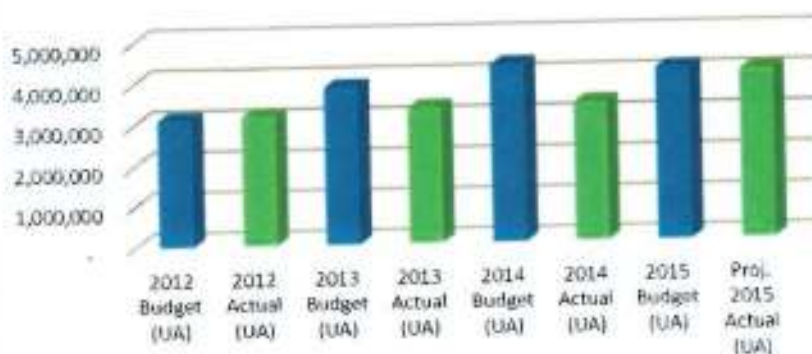
	Project name	Status by end 2015	% completion	Challenges
		- Toolkit for Distribution Loss Reduction - Toolkit to Increase Electricity Access		
	Smart Grid Applications for Distribution Systems of WAPP Member Utilities	Development of Concept Note	5%	Lack of Regional framework

### 3.5. Budget Execution over the period 2012 – 2015

In terms of financial management performance, the following provides a summary of the executions of the WAPP Annual Budgets between 2012 and 2015:

		2012		2013		2014		2015	
		Budget (UA)	Actual (UA)	Budget (UA)	Actual (UA)	Budget (UA)	Actual (UA)	Budget (UA)	Projected Actual (UA)
1	Personnel Expenses	1,414,319	1,256,367	1,718,646	1,407,568	1,867,073	1,526,119	2,043,771	1,889,407
2	General Expenses	336,441	624,455	315,547	371,514	449,751	373,409	436,296	343,547
3	Administrative Expenses	584,569	789,984	906,165	928,370	951,745	844,890	780,471	784,429
4	Executive Board and Committee Meetings	593,539	367,266	733,060	454,455	731,498	581,298	734,252	461,261
5	Capital Expenses	184,835	147,014	189,372	154,381	362,716	71,327	254,821	234,797
<b>TOTAL</b>		<b>3,113,503</b>	<b>3,185,086</b>	<b>3,862,790</b>	<b>3,326,288</b>	<b>4,362,783</b>	<b>3,397,043</b>	<b>4,209,610</b>	<b>4,123,441</b>

**Comparison of Budget to Actual Expenditure  
2012 - 2015**



#### 4. THE 2016 – 2019 BUSINESS PLAN

The 2016 – 2019 Business Plan is the successor to the 2012 – 2015 Business Plan and aims to re-affirm the strategic direction for the WAPP whilst creating a foundational strategy that balances long-term objectives, operational priorities, and financial discipline. The Plan shall serve as a guide for the implementation of the priority projects defined in the ECOWAS Revised Master Plan for Generation and Transmission of Electricity adopted by the Heads of State and Government, as well as the establishment and functioning of the regional electricity market. As a follow up of the 2012 – 2015 Business Plan, the orientation of the entire activities of the WAPP in the medium and long term shall be founded on a strategic analysis of the existing situation, based on Strengths, Weakness, Opportunities and Threats. This orientation shall seek to establish clear and realistic goals based on the vision and mission of WAPP as well as a logical continuation of the programs reflected in the preceding Business Plan. Action Plans shall be proposed together with their resource requirements that shall aim to guide the WAPP Organisation achieve its Objectives over the planning period.

##### 4.1. Strategic Analyses of WAPP

An assessment of the situation of WAPP can be articulated as follows among others:

##### 4.1.1. Strengths

- a. A firm and consistent political will;
- b. A clear and consistent vision over the long-term;
- c. A tradition of cooperation between ECOWAS Member States that prioritises regional integration;
- d. A coherent institutional framework to guide the evolution of the electricity sub-sector in West Africa as well as the regional electricity market – ECOWAS Energy Protocol (creation of WAPP, creation of the ECOWAS Regional Electricity Regulatory Authority, creation of ECOWAS Center for Renewable Energy and Energy Efficiency);
- e. A proven capacity to mutualise planning efforts resulting in common investment programs for the sub-region (development of Master Plans for the Generation and Transmission of existence of several cycles of strategic a Generation and Transmission Development Master Plan);
- f. A demonstrated track record in project conception, preparation, and funds mobilisation and project implementation;
- g. Established framework of consultation and collaboration with International Financing Institutions;
- h. Increasing capacity to attract private sector participation in the programs of WAPP – increasing membership from Private Sector as well as increased financing from Private Sector;

- i. Motivated individuals, mindful of the issues and stakes involved, supported by a Secretariat that is conscious of its role and mission;
- j. All-inclusive participation of WAPP Member utilities through Organisational Committees whose strengths lie in the capacities of their individual members, accustomed over time to working together towards a common objective, capable of transferring their knowledge and expertise based on terms and conditions to be developed and determined.

#### 4.1.2. Weaknesses

- a. Low regional self-financing capacity compared to the investment needs which results in strong dependence on Funding Agencies;
- b. Inability to match demand with enough and quality supply (generation deficit, limited power exchanges, constant blackouts and brownouts, quality of product to be improved (high and uncontrolled costs, frequent load shedding);
- c. Inefficient Power system operations at both the technical and commercial level (huge frequency deviations, significant technical and non-technical losses, low collection rates);
- d. Inadequate operational capacity and insufficient awareness within the WAPP Member utilities on their responsibilities with regards to the functioning of a regional electricity market;
- e. Delayed remittance of Member contributions affects the pace at which the annual work programs are implemented;
- f. Access to information on the operations and evolution of national power systems is challenging;
- g. Lack of clear policies at the regional and national levels that aim to incentivise the injection of new renewable energy technologies into the energy mix are among others, hampering a scaled-up development of these technologies;
- h. Rapidly evolving priorities of national power systems often render incoherent the regional Master Plan resulting in a need for its frequent review and update.

#### 4.1.3. Opportunities

- a. The awareness of decision makers on the latent energy crisis and the possible degeneration of this crisis is an opportunity for a galvanisation of policy makers around solutions to turnaround the situation;
- b. The sub-region continues to be endowed with significant energy resources that could be harnessed for the benefit of the ECOWAS citizenry;
- c. The diverse nature of these regional energy resources implies that their development could reduce dependence on fossil fuel-based generation thereby diminishing exposure to related exogenous shocks;
- d. The expected interconnection of all mainland ECOWAS Member States during this Business cycle provides further market justification for the development of more efficient, environmentally-friendly and economic regional power generation facilities that could displace smaller, costly and older facilities within the Member States;



- e. Strong private sector appetite to participate in the development of the WAPP system;
- f. The gradual restructuring of the power utilities within ECOWAS Member States is expected to yield increased efficiencies in management, operations as well as creditworthiness;
- g. The cost improvement in deploying renewable energy projects, especially Solar, could translate to increased willingness by ECOWAS Member States to augment their portion in the regional energy mix;

#### 4.1.4. Threats

- a. The failure to meet ever increasing energy needs of a region whose population is growing at a fast rate;
- b. A region that has witnessed conflicts and epidemics that have negatively impacted the project development process;
- c. Scarcity of concessional funding affects the timely implementation of projects
- d. Financial constraints within utilities affect their capacity to effectively take part in the development of the regional electricity market;
- e. The inability of the power sub-sector to maintain cost-reflective tariffs;
- f. Eroding human capital in the regional electricity sub-sector due to retirement of staff that far exceeds the influx of graduates specialised in power;
- g. Misalignment of procurement processes and/or requirements of International Financing Institutions adds to the complexities of regional project that are already complex in their nature

#### 4.2. Rationale for the 2016 – 2019 Business Plan

As reflected in the above SWOT analyses, the formulation of this Business Plan is against a backdrop where the sub-region is characterised by a supply – demand imbalance that is periodically exacerbated by unforeseen situations such as volatility of fuel prices and inadequate rainfall. The sustainability of the strong economic growth enjoyed by the sub-region shall require that the power supply challenges are addressed in order to catalyse further development. In addition, the progressive integration of the national power systems of ECOWAS Members States, envisaged to be completed by 2019, lends urgency for an accelerated establishment and operationalisation of the regional electricity market in order to provide the required framework and platform for enhanced cross-border trading within the region. These factors shall be the primary impetus underlining the objectives of this Business Plan. A need to significantly augment the region's generation capacity with a diverse energy mix and an acceleration in the roll-out of the interconnections to integrate the remaining ECOWAS Member States shall guide the Infrastructure program of this Plan. In addition, the envisaged completion of the WAPP ICC within the period shall require that the necessary human and material resources be available to ensure its proper functionality be incorporated into this Plan.

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#### 4.3. Objectives of the 2016 – 2019 Business Plan

On the basis of the above-mentioned rationale and in light of the sub-regional context, the Objectives of the WAPP Business Plan can be articulated as follows:



These Objectives reflect the priority areas that require focus in the business cycle to enable WAPP on the one hand further consolidate the gains realised to date and on the other, attain an effective launch of the regional electricity market.

##### 4.3.1. OBJECTIVE 1: Update ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy

The fundamental goal of the Master Plan is to set out a clear, comprehensive and coherent vision for the future development of power generation and transmission infrastructure in the region. The Master Plan also dictates the priority investments that the WAPP needs to pursue to ensure that the WAPP vision, which is completely synonymous with the energy integration ideals of ECOWAS, are achieved. It also provides donors with a rational basis for decision-making on various energy infrastructure projects submitted to them for consideration. The major differences between the goals of the former regional master plan and the effective development of the regional and national power systems of WAPP Member Utilities justify the need for an updating of the Master Plan in 2018. The objective would be to integrate the power sector developments within ECOWAS Member States into the medium and long term strategy for the expansion of the regional generation and transmission infrastructure, while remaining consistent with the vision of the WAPP.

#### 4.3.2. OBJECTIVE 2: Implement WAPP Priority Projects

The infrastructure program under this Business Plan cycle shall assume on the one hand, a logical continuation of the development projects in the preceding Plan and on the other, aim to address the supply deficit whilst ensuring completion of the integration of the national power systems of mainland ECOWAS Member States. It is envisaged that the national power systems of all 14 mainland ECOWAS Member States shall be interconnected by 2019. The projects to be pursued within the period 2016 to 2019 among others are indicated in Annex 2.

Critical for the successful attainment of this objective is the timely preparation and mobilisation of financing for the implementation of the projects. Equally vital is enhanced coordination among Project Executing Agencies as well as improved efficiency in the procurement and delivery of projects. As such, the WAPP during this Business cycle shall leverage lessons learnt from projects such as the 225 kV Côte d'Ivoire – Liberia – Sierra Leone – Guinea Interconnection Project and the 225 kV Bolgatanga (Ghana) – Ouagadougou (Burkina) Interconnection Project with a view to consolidating further the deployment of the "Special Purpose Company" or "Joint Implementation Committee" models in projects where they would make sense. In addition, the WAPP shall seek to reinforce collaboration with the International Financing Institutions and pursue more partnerships with the private sector in the implementation of the priority projects. Efforts shall also be made to better align initiatives between ECOWAS Member States and their bilateral Partners with the WAPP programs.

#### 4.3.3. OBJECTIVE 3: Establish a Regional Electricity Market

In continuance with the previous Business Plan, the establishment of the Regional Electricity Market objective, is again sub divided into a number of lower level objectives, in addition to the new role of independent Regional System Market Operator (RSMO).

- A. Influencing political/regulatory decision making: Establishment of the regional market requires direct interaction with policy makers and regulators. The ICC therefore needs to interface with policy and regulators to ensure smooth market initiation activities. In addition, electricity and gas are tightly coupled; (no gas, no electricity; no electricity no gas) it is therefore absolutely essential that policy on each is made with due regard to the other if the electricity market is not be adversely impacted.
- B. Develop the Market: Much work remains to be done in developing the market. The work to be done is as listed in the Market Implementation Roadmap and detailed in Annex 3.
- I. Implementation of the WAPP ICC
  - II. Implementation of the Operations Manual
  - III. Interconnected Priority projects Synchronisation

- IV. Certification Programme for System Operators
- V. Capacity Building for ICC Staff and Staff of the Operations Centre
- C. Operate and Manage the Integrated Market

Operation and Management of the integrated system and market means the monitoring, maintaining and operating the market in addition to monitoring and providing information on the integrated regional network. This is a prime task for the ICC/RSMO when the market is established.

The established regional electricity market has a long way to become a modern well-oiled market that is serving the needs of its participants. The ICC/RSMO as the market operator has a huge responsibility in developing and enhancing the market and system infrastructure.

The activities associated with this objective include:

- I. Ensure availability and reliability of regional power system;
- II. Coordinate and Enhance Robust Planning Processes and studies;
- III. Remain authoritative source of Information on Key Issues.
- IV. Conduct Distribution Loss Reduction study & Implement loss reduction schemes
- V. Implement Emergency Power Programs
- VI. Improve the financial standing of the utilities
- VII. Reinforce technical cooperation and exchange programme with stakeholders of the power sector; and
- VIII. Contribute towards the development of best practice in energy efficiency

#### D. Update and Maintain Management Information System and M&E

These facilities are essential requirements for developing a market. A modern day electricity market cannot exist without having a working reliable MIS. The MIS shall be used to store, analyse, retrieve information and assist in decision making. The M&E system is used to retrieve data and publish information to all stakeholders and other interested parties. In particular, the MIS and M&E shall be used to create and manage various System (Network) and Market databases including a database on distribution equipment.

The details of the work packages/projects are as indicated in Annex 3 – ICC Projects List. These work Packages, associated with each of the high level objectives, in general are based on the following assumptions and constraints:

- a) Funding is available for identified work packages
- b) Human and other resources are available
- c) WAPP continues to enjoy the support of its member utilities
- d) Political, economic and social dimensions in the sub region continue to remain favourable
- e) ICC/RSMO staff continues with skill enhancement activities
- f) ICC/RSMO develops a proactive team approach to work packages
- g) ICC project delivers on all of its deliverables

- h) MIS is up and running well
- i) ICC/RSMO work package costs may exceed funding availability

The following are considered as threats to the ICC/RSMO implementation plan with propositions for mitigating measures:

<u>Risk</u>	<u>Occurrence</u>	<u>Impact</u>	<u>Mitigating Measures</u>
No political will at national and regional level	Medium	High on time and sustainability	Enhance collaboration with national stakeholders as well as ECOWAS Commission and Regional Regulator
ICC Project is delayed	Medium	Low on cost	Ensure Project timelines are respected
Interconnection Projects delayed	High	High in cost and time	Enhance coordination and Partner engagement
Over cost linked to insufficient competition	Medium	High on time	The tendering policy will be reviewed carefully by the PIU to ensure maximum competition for each bid.

#### 4.3.4. OBJECTIVE 4: Implement the WAPP Dark Fibre Project

The project aims to create a Dark Fiber leasing Consortium to provide an opportunity for WAPP member utilities to recoup part of their capital expenditures and offset part of their operating costs by leasing excess dark fibre capacity on the WAPP transmission lines.

The WAPP Dark fiber leasing consortium would engage a management company to oversee and implement the fiber leasing program with the WAPP ICC serving as coordinator for the participating utilities. The management company would provide telecom operator customers with one-stop shopping for their fiber needs and a single point of contact for network design, scheduling of installation, maintenance and repairs.

#### 4.3.5. OBJECTIVE 5: Enhance the effectiveness of the Secretariat workforce and augment organizational excellence

The attainment of the WAPP vision is greatly dependent on the availability of qualified and competent staff at the level of the WAPP Secretariat and the Member Utilities capable of transforming the energy integration ideal of ECOWAS into reality. It is within this perspective that the WAPP prepared in 2008, a strategic plan for reinforcing capacity titled the "Capacity Building Program Initiative (CBPI)" that identified the human resource competency and material that the Organisation to effectively play its role. It should be noted that the CBPI is currently being updated.

Notwithstanding, the key areas that the CBPI identified as requiring focus include:

❖ **WAPP Governance**

At the Political level, sufficient competency exists to develop WAPP and the regional electricity market. However, there is a need to increase understanding of Power Pools and regional Electricity Markets among Stakeholders, to facilitate decision making.

❖ **Regional Regulatory framework**

ECOWAS has sufficient Policy Making capability to promulgate regional regulatory acts and enact a regulatory policy for the Power Pool and the regional electricity market. There is however a need to increase understanding of regional tariff policy setting, power pool arrangements/agreements and experience in tariff methodology preparation.

❖ **System Operations**

Sufficient competency exists to follow-up and update, as necessary, the adopted Master plan and the WAPP Priority Projects. Nonetheless, greater understanding of the business/commercial, legal and technical issues associated with cross-border energy trade and power pool operations is needed among stakeholders to facilitate harmonized Codes.

In addition, there is an urgent need to develop a WAPP System Operator certification process, as adopted by the WAPP System Operation Manual, if the Certification process is to be implemented in accordance with the overall timetable for the operationalization of the regional electricity market. This endeavour shall require increasing competency among key actors with respect to power pool operations, certification and accreditation, training of trainers and instructors and upgrading of Training Centers;

To facilitate the necessary Information Exchange associated with Power Pool operations and regional electricity markets, it will be necessary to develop appropriate Information Exchange protocols relative to the market structures that evolve for the WAPP. Some knowledge of such protocols exists but needs to be further enhanced;

For WAPP to function in a commercially sustainable manner, it will require sophisticated software programs for monitoring and control of Systems Operations and for Energy Trading. The nature of such software packages will be dependent on the WAPP market structure. Some understanding of such software packages exists but appropriate training will be necessary for those professionals who will be responsible for carrying out activities associated with sustainable commercial operations.

❖ **Financial Environment to accelerate investment**

It will be necessary to attract private investment in addition to those funds available through institutional financing organizations to implement all the needed infrastructure projects to make the WAPP a reality. The most appropriate

approach will be to engage in strategic alliances and partnerships with the public and private sectors for the development and implementation of the priority projects.

Attracting private sector investment can be facilitated if there are clear project development processes and due diligence procedures. There exists competency in project development and implementation but no standardized Power Purchase Agreements, Due Diligence procedure nor Project Development process.

The 2012 – 2015 Business Plan incorporated programs that aimed to address these capacity requirements and as such, the 2016 – 2019 Business Plan shall therefore reflect a consolidation of the achievements as well as a rational continuation of the activities whilst taking into account the status of development of the regional electricity market. As enunciated in the CBPI, the focus of capacity reinforcement in this Business Planning cycle shall continue to include Governance of the Electricity Sub-sector, Management and Procurement of Projects, Financing under Public-Private Partnerships, and Environmental and Social Considerations of Transmission Line Projects. Particular attention shall be paid to training related to managing the regional electricity market as well as the operation of interconnected power systems.

It is envisaged that the capacity reinforcement shall be through the following:

➤ *Training of Personnel from WAPP Member Utilities:*

This shall be through three (3#) groupings that are based on the maturity of the national power systems to establish the regional electricity market:

- Group I (Nigeria, Ghana)
- Group II (Côte d'Ivoire, Senegal, Mali, Benin, Togo, Burkina Faso, Niger)
- Group III (Guinea, Sierra Leone, The Gambia, Guinea Bissau, Liberia)

➤ *Training of Staff from WAPP Secretariat and Information and Coordination Center:*

This shall involve programs on the management of a regional electricity market as well as coordination of interconnected systems

➤ *Creation of Regional Centers of Excellence:*

This shall involve the finalization of pre-investment studies and Business Plans for the five (5#) Centers of Excellence and launch the process to mobilise financing for their realization.

➤ *Recruitment of Personnel for WAPP Secretariat:*

This task shall ensure that the staff complement required by the respective Departments of the WAPP Secretariat to implement their activities are recruited on time with the necessary qualifications and competencies.



The following depicts the indicative capacity building program to be implemented during the period among other areas:

*A. Training of WAPP Member Utilities*

*A.1. Training for Group I (Ghana, Nigeria):*

- Electricity Market Business Processes
- Increasing Private Sector Participation and Structuring Public-Private Partnerships (PPPs) in the Power Sector
- Management of Interconnected Systems (Deployment of WAPP Operations Manual)
- Power Sector Reform and Re-structuring for Women
- Making viable Renewable Energy Projects in an Interconnected system
- Power Sector-related legal Agreements (Power Purchase Agreement (PPA), Transmission Service Agreement (TSA), Ancillary Services Agreement (ASA), etc.)
- Minimizing Environmental and Social Impacts of Power Projects
- Study Tour to the Power Pools

*A.2. Training for Group II (Côte d'Ivoire, Senegal, Mali, Benin, Togo, Burkina, Niger):*

- Power System Governance ( Unbundling, Regulation, Transmission Tariff, etc)
- Electricity Market Business Processes
- Increasing Private Sector Participation and Structuring PPP in the Power Sector
- Management of Interconnected Systems (Deployment of WAPP Operations Manual)
- Power Sector Reform and Re-structuring for Women
- Making viable Renewable Energy Projects in an Interconnected system
- Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)
- Minimizing Environmental and Social Impacts of Power Projects
- Study Tour to the Power Pools

*A.3. Training for Group III (Guinea, Sierra Leone, The Gambia, Guinea Bissau, Liberia):*

- Power Systems Operations and Maintenance
- Managing Non-Technical Losses in Power Systems
- Project Management and Structuring
- Power System Governance ( Unbundling, Regulation, etc.)
- Electricity Market Business Processes
- Increasing Private Sector Participation and Structuring PPP in the Power Sector

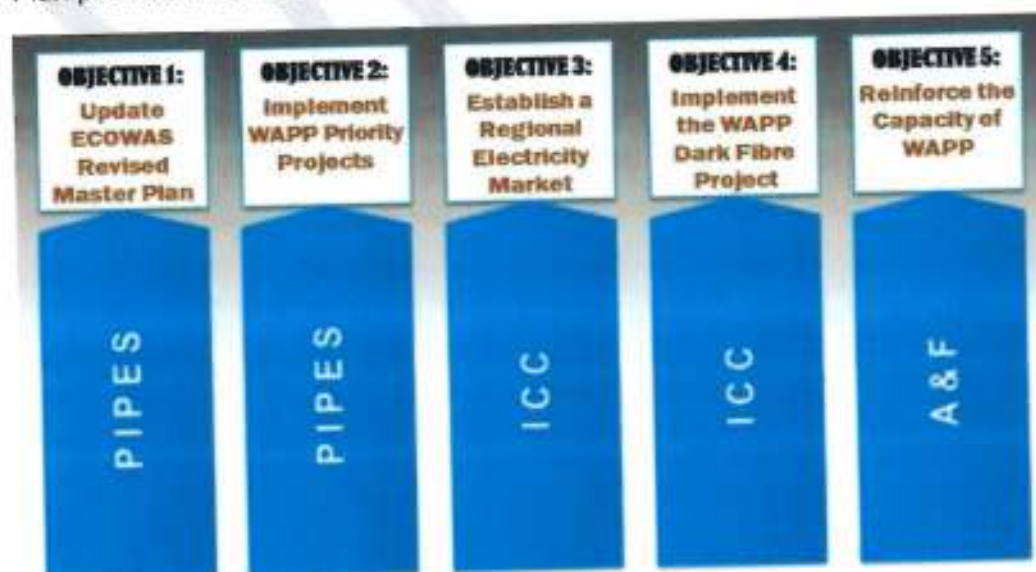
- Management of Interconnected Systems (Deployment of WAPP Operations Manual)
- Power Sector Reform and Re-structuring for Women
- Making viable Renewable Energy Projects in an Interconnected system
- Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)
- Minimizing Environmental and Social Impacts of Power Projects
- Study Tour to the Power Pools

#### B. Training of WAPP Secretariat

- Power System Governance (Unbundling, Regulation, Transmission Tariff);
- Electricity Market Business Processes
- Management of Interconnected Systems (Deployment of WAPP Operations Manual);
- Electricity Market Management/Software.
- Increasing Private Sector Participation in the Power Sector / Structuring Public-Private Partnerships in a Power Sector;
- Making viable Renewable Energy Projects in an interconnected system;
- Power sector-related legal Agreements (Power Purchase Agreements, Transmission Service Agreements, Ancillary Service Agreements);
- Minimizing Environmental and Social Impacts of Power Projects;
- Training on Administrative and Accounting Management.

#### 4.4. Implementation of the 2016 – 2019 Business Plan

The primary Structures within the WAPP Secretariat, under the direction of the Secretary General with oversight from the Executive Board and the WAPP General Assembly that shall drive the respective processes to attain the Objectives defined for the Business Plan period are as follows:



It is therefore apparent that the achievement of these Objectives is contingent on these Departments and the WAPP Secretariat being among others, adequately resourced and endowed with the right human capital.

#### **4.4.1. Organisational Requirements**

##### **4.4.1.1. PIPES Department**

The strategic goals of WAPP under the supervision of PIPES relate to the planning and implementation of regional energy infrastructure indicated in this Business Plan. The PIPES Department, in close collaboration with the SPEC and its Taskforces, shall continue to be responsible for among others, supervising the development and implementation of projects right from the planning phase through to the commissioning of the projects (pre-feasibility and feasibility studies, financing mobilisation, preparation of tender documents, and implementation coordination). The Department shall also be responsible for maintaining the coherence and relevance of the Master Plan as the basis for guiding investments to ensure the operational viability of the WAPP interconnected system. The Department shall in addition maintain constant interaction with Donors to coordinate the mobilisation of funds for the preparation and implementation of projects as well as coordinate the interventions of Donors on the projects. The activities to be undertaken by the Department in respect of the projects defined under the related Objectives are indicated in Annex 4

The human resources of the PIPES Department currently in charge of all activities relating to the implementation of the priority investment programme consist of the following:

- The Director of PIPES, responsible for the supervision of the overall activities of the Department;
- The Head of Studies, Planning and Funds Mobilisation, responsible for the preparation of the Priority Projects and mobilisation of financing;
- Two (2#) Project Coordinators seconded to the WAPP by VRA and EDG, facilitated by USAID;
- One (1#) Project Coordinator from ECG and on contract responsible for the Medium Voltage Cross Border Projects;

A resident Environmental and Safeguards Expert, funded by AfDB as well as an Advisor on Public-Private Partnerships funded by USAID, also support the Department. Both Experts are expected to be at the Secretariat until 2018. With support from WB, the recruitment of a 3-yr resident Hydropower Expert was being concluded.

In addition, a 2.5-yr resident Technical Assistance to the WAPP Secretariat, contracted within the framework of the cooperation between the European Union and WAPP, is scheduled to conclude in December 2015. Discussions are ongoing with the EU for a 1-yr extension.



As indicated in Annex 5, the envisaged organizational structure for the period 2016 - 2019 assumes full-time personnel for the PIPES Department whose activities would continue to revolve around two (2#) Divisions (Studies, Planning and Funds Mobilisation; Coordination and Monitoring). During the period, the secondment program shall be phased out and the functions maintained by recruited permanent staff in light of the slowly improving situation of WAPP Member Utilities. The WAPP Partners shall nonetheless still be engaged to provide capacity reinforcement support through the provision of resident Technical Assistance as well as Resident Experts especially in light of the critical endeavour of updating the ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy. Furthermore, in consideration of the increased number of projects expected to graduate into their construction phase during the period, the management of the Department shall also be reinforced by the recruitment of the Head of Division, Coordination and Monitoring.

#### **4.4.1.2. ICC**

The responsibilities of the ICC have not changed. However, in the coming business period, the ICC will become the independent Regional System Market Operator (RSMO) as depicted in the Decision passed by the WAPP General Assembly in November 2012 in Abuja.

The ICC/RSMO will be the leader in developing regional strategy for integrating the West African power system, based on cooperative efforts among participants, to energise, develop, and deliver system efficiency and improved reliability. This will be achieved through the continued development of the market leveraging the political, legal, technical, financial and social dynamics of the region.

Achieving this broader regional strategy will require a commitment among participants to deliver on the strategies listed in this plan. An effective regional strategy will enhance reliability and expand the benefits of competitive markets in local markets, while preserving the local market governance structures.

The current ICC/RSMO staff number is 10 made up of the following:

- The Director of ICC responsible for the supervision of the overall activities of the ICC;
- An Engineer and economist responsible for activities relating to the implementation of the Regional Electricity Market;
- An Engineer responsible for ensuring optimal functioning of the network (monitoring of the system, ensuring that technical, organisational, procedural and material conditions are in place in order to attain network reliability and security;
- One (1#) IT Specialist with one (1#) Assistant, responsible for activities relating to ICT;
- An Engineer responsible for Monitoring and Evaluation
- Two (2#) Electrical Engineers for Systems Planning and Operations

- Two (2#) Telecom/SCADA/EMS engineers
- One (1#) Bilingual Secretary

The ICC/RSMO shall require additional resources to be able to undertake the works planned. The AETS-EDF-RTE consortium on the ICC project recommended in the "ICC Project Organisational Staffing" document, that the ICC/RSMO will require a total staffing level of 53 when the market is fully established. That is the ICC/RSMO needs additional 43 persons to undertake all the works listed in the four ICC/RSMO objectives defined earlier.

The high level ICC/RSMO organisational chart is as shown in Annex 6.

#### **4.4.1.3. A&F Department**

The role of the A&F Department is to strengthen the organizational structure of the WAPP and to manage the financial and accounting system of the WAPP Secretariat. As indicated in Annex 7, the Department is organized into three (3#) Divisions and One (1#) Unit. Each Division is supervised by a Head of Division whilst the Unit is led by an Officer, with areas of responsibility as indicated below:

- **Administration Division:** General administration, fleet management, maintenance of buildings and equipment, management of WAPP - ICC headquarters construction, security guard, documentation, translation, management of lease contracts.
- **Finance & Accounts Division:** Budget preparation and monitoring, finance and accounting, disbursement, payroll, petty cash, cash management, procurement and stock management.
- **Human Resources Division:** Staff management, recruitment, guidance, training, integration, performance appraisal, separation, departure programming, staff contract management, maintenance of staff files.
- **Protocol Unit:** Travel arrangements, visa applications, reception and accommodation of guests, meeting logistics, social receptions and events, Government relation. The Protocol Unit, which is directly under the Director, is under the responsibility of a Protocol Officer.

It is expected that a Project Accountant and an Assistant Protocol Officer shall be recruited during the period in anticipation of increased activities of the Secretariat.

#### 4.4.2. Budgetary and Financing Requirements

As elaborated upon in Annexes 8, 9 and 10, the Budget of the WAPP for the 2016 - 2019 Business Plan cycle is approximated at **US\$13,444,497,667** summarized as follows:

- **US\$13,190,837,000** is required to cover the implementation of the Priority Projects during the period. US\$7,046,151,000 has already been earmarked/secured from Partners and US\$4,671,000 shall be from WAPP Member Utilities leaving a financing gap of **US\$6,140,015,000** envisaged to be mobilised from Partners;
- **US\$157,793,000** to operationalise the ICC and implement the regional electricity market;
- **US\$39,588,667** for the Operating Budget of the WAPP Secretariat.
- **US\$56,279,000** is required during the period to cover the implementation of the Capacity Building Program including the WAPP Centers of Excellence. US\$2,966,000 has already been earmarked/secured from Partners and US\$180,000 shall be from WAPP Member Utilities leaving a financing gap of **US\$53,313,000** envisaged to be mobilised from Partners.

A 5% Contingency provision implies that the estimated Budget is **US\$14,116,722,551**.

## 5. EXPECTED OUTCOMES

The outcomes expected to be achieved at the end of the 2016 – 2019 period assuming timely availability of resources among others, are detailed out in Annexes 11, 12 and 13. In summary, it is envisaged that all 14 mainland ECOWAS Member States would be interconnected, construction on approximately 5,900 MW of generation capacity would have significantly advanced as well as for about 6,100 km of high voltage interconnection lines. Furthermore, the ECOWAS Heads of State and Government shall have adopted an updated Master Plan for the Generation and Transmission of Electrical Energy. In addition, the construction of the WAPP Information and Coordination Center in Calavi, Republic of Benin shall have been completed as well as the linkages to the designated Control Area Centers.



## 6. CONCLUSION

The 2016 – 2019 WAPP Business Plan, as part of continuing endeavours by the WAPP Organisation to attain its vision, reflects the outcomes of a strategic evaluation of realisations to date and proposals on realistic actions to be undertaken in the medium term to meet set Objectives that derive from a logical continuation of programs and activities from the preceding Plan.

The main thrust of this Business Plan, as mirrored in the proposed five (5#) Objectives guiding its implementation, shall focus on accelerating the development of the interconnection projects required to complete the integration of national power systems of ECOWAS Member States in conjunction with an augmentation of power generation capacity to address the supply – demand imbalance. The implementation of the Business Plan shall also graduate WAPP from an institutional mechanism featuring bi-lateral cooperation to a market-based institutional mechanism through the effective operationalisation of the regional electricity market. In addition, the capacity building featured in the Business Plan features intensive training programs for WAPP Member Utilities that envisages the development of regional Centres of Excellence and a strengthening of the Departments within the WAPP Secretariat to enable them develop and implement the Programs outlined in the Business Plan. The updating of the Master Plan shall ensure that the WAPP Investment Program remains coherent and relevant to attaining the energy integration ideals of ECOWAS.

The Budget for the 2016 – 2019 WAPP Business Plan is estimated at US\$13,444,497,667 comprising US\$13,190,837,000 to cover the development of the Priority Projects, US\$157,793,000 to operationalise the ICC and implement the regional electricity market, US\$56,279,000 to implement the Capacity Building Program including the WAPP Centers of Excellence, and US\$39,588,667 for the Operating Budget of the WAPP Secretariat. For the Priority Projects, an amount of US\$7,046,151,000 has already been earmarked/secured from Partners and US\$4,671,000 is expected to be addressed by WAPP Member Utilities leaving a financing gap of US\$6,140,015,000 envisaged to be mobilised from Partners. With respect to the Capacity Building Program, US\$2,966,000 has already been earmarked/secured from Partners and US\$180,000 shall be from WAPP Member Utilities leaving a financing gap of US\$53,313,000 envisaged to be mobilised from Partners. A 5% Contingency provision on the estimated Budget implies that the financial resources required is US\$14,116,722,551.

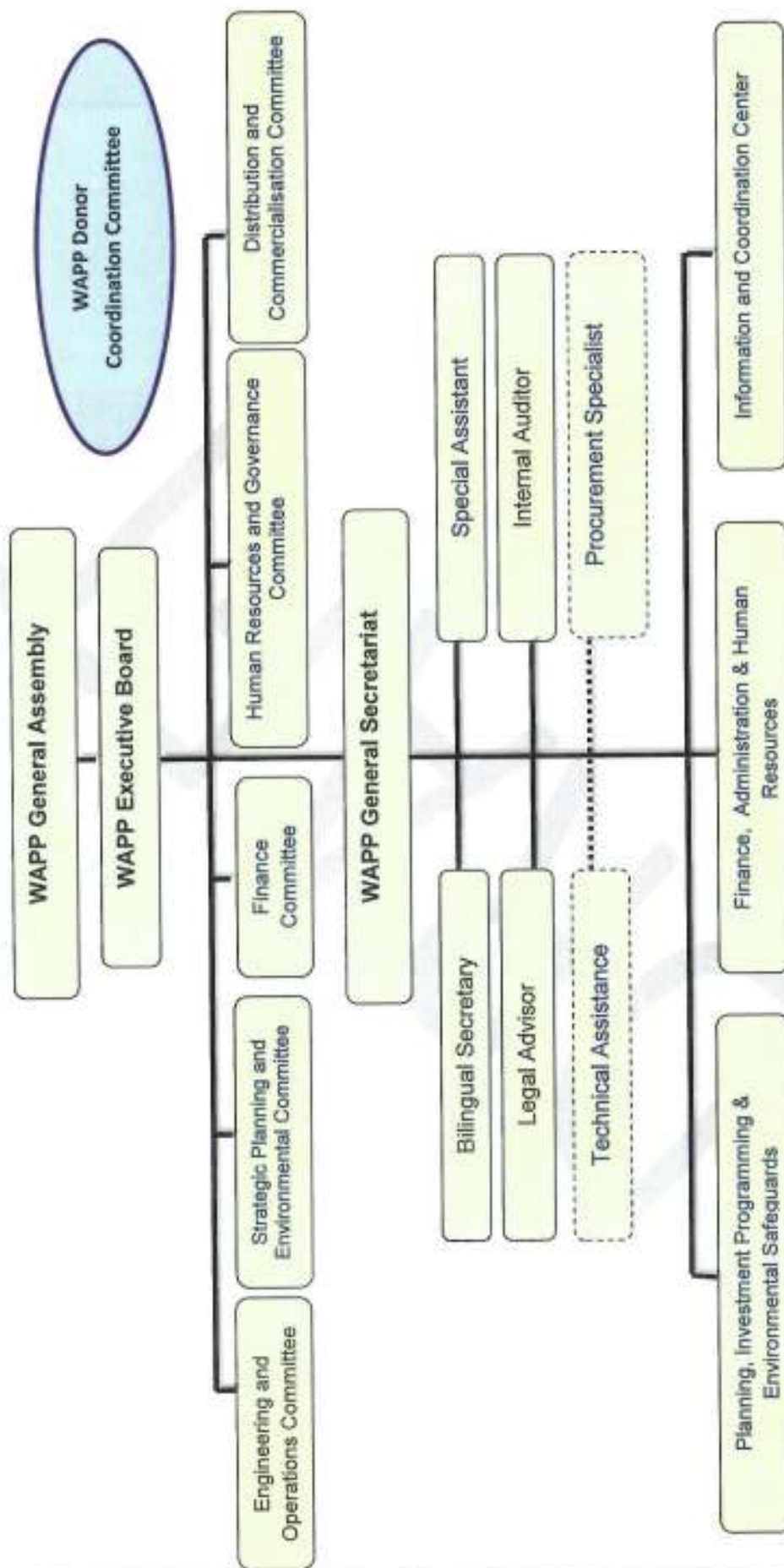
It is therefore quite evident that the timely support and financial contributions of WAPP Member Utilities and Funding Agencies remains a Critical Success Factor for the successful attainment of the objectives set out in this Business Plan. In addition, a reinforced collaboration within the WAPP and with ECOWAS Commission, Funding Agencies and other key stakeholders, shall be vital for the successful implementation of the Business Plan.

## ANNEXES



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# **ANNEX 1: THE WAPP ORGANISATION**



## ANNEX 2: TIMING OF PROJECTS

Activity	Project	2016	2017	2018	2019
Prepare Pre-Investment studies and Mobilise financing for WAPP Projects	330 kV Côte d'Ivoire – Ghana Interconnection Reinforcement Project;				
	225 kV Ghana – Burkina Faso – Mali Interconnection Project;				
	330 kV Northcore Interconnection Project (Nigeria, Niger, Burkina, Togo/Benin);				
	225 kV Guinea - Mali Interconnection Project;				
	515 MW Souapiti Hydropower Project (Guinea);				
	330 kV Nigeria - Benin Interconnection Reinforcement Project				
	WAPP Solar Power Park in Burkina;				
	Master Plan for MV Cross Border Projects				
	300 - 665 MW Amaria Hydropower Project (Guinea)				
	225 kV Côte d'Ivoire - Liberia Interconnection Reinforcement Project				
	291 MW Grand Kinkon Hydropower Project (Guinea)				
	Update ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy				
	330 kV WAPP Median Interconnection Reinforcement Project (Nigeria-Benin-Togo-Ghana)				
Activity	Project	2016	2017	2018	2019
Coordinate and/or Monitor Implementation of WAPP Priority Projects	330 kV Volta (Ghana) – Lomé 'C' (Togo) – Sakete (Benin) Interconnection Project;				
	225 kV Bolgatanga (Ghana) – Ouagadougou (Burkina Faso) Interconnection Project;				
	330 kV Aboudze (Ghana) – Prestea (Ghana) – Bolgatanga (Ghana) Transmission Line Project;				
	225 kV Côte d'Ivoire – Liberia – Sierra Leone – Guinea Interconnection Project;				
	225 kV OMVG Interconnection Line (Senegal, The Gambia, Guinea Bissau, Guinea)				
	330 kV Côte d'Ivoire – Ghana Interconnection Reinforcement Project;				
	225 kV Ghana – Burkina Faso – Mali Interconnection Project;				
	225 kV Guinea - Mali Interconnection Project;				
	330 kV Northcore Interconnection Project (Nigeria, Niger, Burkina, Togo/Benin);				
	330 kV Nigeria - Benin Interconnection Reinforcement Project				
	225 kV Côte d'Ivoire - Liberia Interconnection Reinforcement Project				
	225 kV Marantali (Mali) – Kita (Mali) – Bessiko (Mali) Transmission Reinforcement Project				
Activity	Project	2016	2017	2018	2019
Coordinate and/or Monitor Implementation of WAPP Priority Projects	3050 MW Mambilla Hydropower Project (Nigeria);				
	700 MW Zungeru Hydropower Project (Nigeria);				
	515 MW Souapiti Hydropower Project (Guinea);				
	450 MW WAPP Maria Gleta Regional Power Generation Facility (Benin);				
	450 MW WAPP Domunli Regional Power Generation Facility (Ghana);				
	300 - 665 MW Amaria Hydropower Project (Guinea)				
	281 MW Koukoumba Hydropower Project (OMVS - Senegal, Mali, Guinea, Mauritania)				
	220 MW Tiboto Hydropower Project (Côte d'Ivoire, Liberia);				
	181 MW Balassa Hydropower Project (OMVS - Senegal, Mali, Guinea, Mauritania)				
	160 MW Boureya Hydropower Project (OMVS - Senegal, Mali, Guinea, Mauritania);				
	147 MW Adjarala Hydropower Project (Togo, Benin);				
	140 MW Guina Hydropower Project (OMVS - Senegal, Mali, Guinea, Mauritania);				
	128 MW OMVG Sambangalou Hydropower Project (OMVG - Senegal, The Gambia, Guinea Bissau, Guinea)				
	64 MW Mount Coffee Hydropower Project (Liberia)				
Activity	Project	2016	2017	2018	2019
Develop and implement Medium Voltage Cross-border projects	Côte d'Ivoire - Liberia MV cross border project				
	Ghana - Togo South MV cross border project				
	Benin - Togo North MV cross border project				
	3rd Generation MV Cross Border Projects				



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### ANNEX 3: ENVISAGED ICC ACTIVITIES

<u>Objective</u>	<u>Planned Activity</u>
a. Establish Governance documents for the functioning of the regional market	Organise ERERA-ICC meetings to elaborate, examine and adopt the required documents for the establishment of the market
b. Enhance the visibility of ICC	Develop a Communication and Marketing Plan with the support of Specialists
c. Establish the Regional Electricity Market	<ul style="list-style-type: none"> <li>➤ <b>Facilitate regional trading</b> <ul style="list-style-type: none"> <li>- Collate national Regulations and verify that they facilitate trading</li> <li>- Develop Regulations that facilitate trading and submit to countries for adoption</li> </ul> </li> <li>➤ <b>Establish commercial Market Rules including ancillary services</b> <ul style="list-style-type: none"> <li>- Amend the Market Rules as well as Operations Manual and develop network access rules.</li> </ul> </li> </ul>

<u>Objective</u>	<u>Planned Activity</u>
d. Implement ICC Project to enable ICC play its role of Regional System Market Operator	<ul style="list-style-type: none"> <li>- Construct the ICC Building under supervision of Owners' Engineer;</li> <li>- Supply and Install equipment;</li> <li>- Acquire decision-making tools</li> <li>- Complete Factory and Site tests</li> <li>- Conduct training;</li> </ul>



<p>e. Implement WAPP Operations Manual</p>	<ul style="list-style-type: none"> <li>- Continue the implementation of the Synchronisation Project (examine and adopt contractual documents, preparation of Bidding Documents for the supply of equipment, etc.</li> <li>- Acquire appropriate tools for network study and analyses</li> <li>- Conduct studies to ensure the reliability of the network as well as supply/demand balance etc.</li> <li>- Develop technical norms and standards for the interconnected system</li> <li>- Implement the Operating Instructions as defined in the WAPP Operations Manual</li> <li>- Develop Certification Program for WAPP System Operators</li> <li>- Train WAPP System Operators</li> <li>- Revise WAPP Operations Manual</li> <li>- Assume the role of System Operator by coordinating the operation of the WAPP Interconnected System</li> <li>- Conduct training to enhance the capacities of staff from WAPP ICC and Control Area Centers</li> </ul>
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<u>Objective</u>	<u>Planned Activity</u>
f. Improve Energy Efficiency	<ul style="list-style-type: none"> <li>- Complete the Distribution Investment Development and Loss Reduction Program</li> <li>- Implement the Investment Plans and Loss Reduction Programs in at least 3 countries</li> <li>- Organise fora to sensitise and disseminate Best Practices in the area of energy efficiency</li> </ul>
g. Reinforce technical cooperation and exchange programs among Stakeholders in the electricity sub-sector	<ul style="list-style-type: none"> <li>- Participate in sub-regional and international events relating to system operations, competitive markets, and telecommunication equipment - SCADA/EMS/MMS</li> <li>- Organiser events aimed at enhancing visibility on WAPP activities and disseminate information on the market</li> </ul>

<u>Objective</u>	<u>Planned Activity</u>
h. Update and maintain the WAPP MIS and augment capacity in M&E	<ul style="list-style-type: none"> <li>- Collect data to update MIS</li> <li>- Update MIS</li> <li>- Conduct training for M&amp;E Focal Points</li> <li>- Develop and put in place a reliable database on system and market operations as well as generation, transmission and distribution facilities of WAPP Member Utilities</li> </ul>
i. Enhance electronic archive/retrieval system of WAPP	Electronically archive all WAPP documents
j. Implement WAPP Dark Fibre Project	<ul style="list-style-type: none"> <li>- Coordinate the signature of the Consortium Agreement by the concerned Utilities</li> <li>- Engage the Management Company for the Dark Fibre</li> <li>- Coordinate the signature of Agreement between the Management Company and the Dark Fibre Consortium</li> </ul>



#### ANNEX 4: ENVISAGED PIPES ACTIVITIES

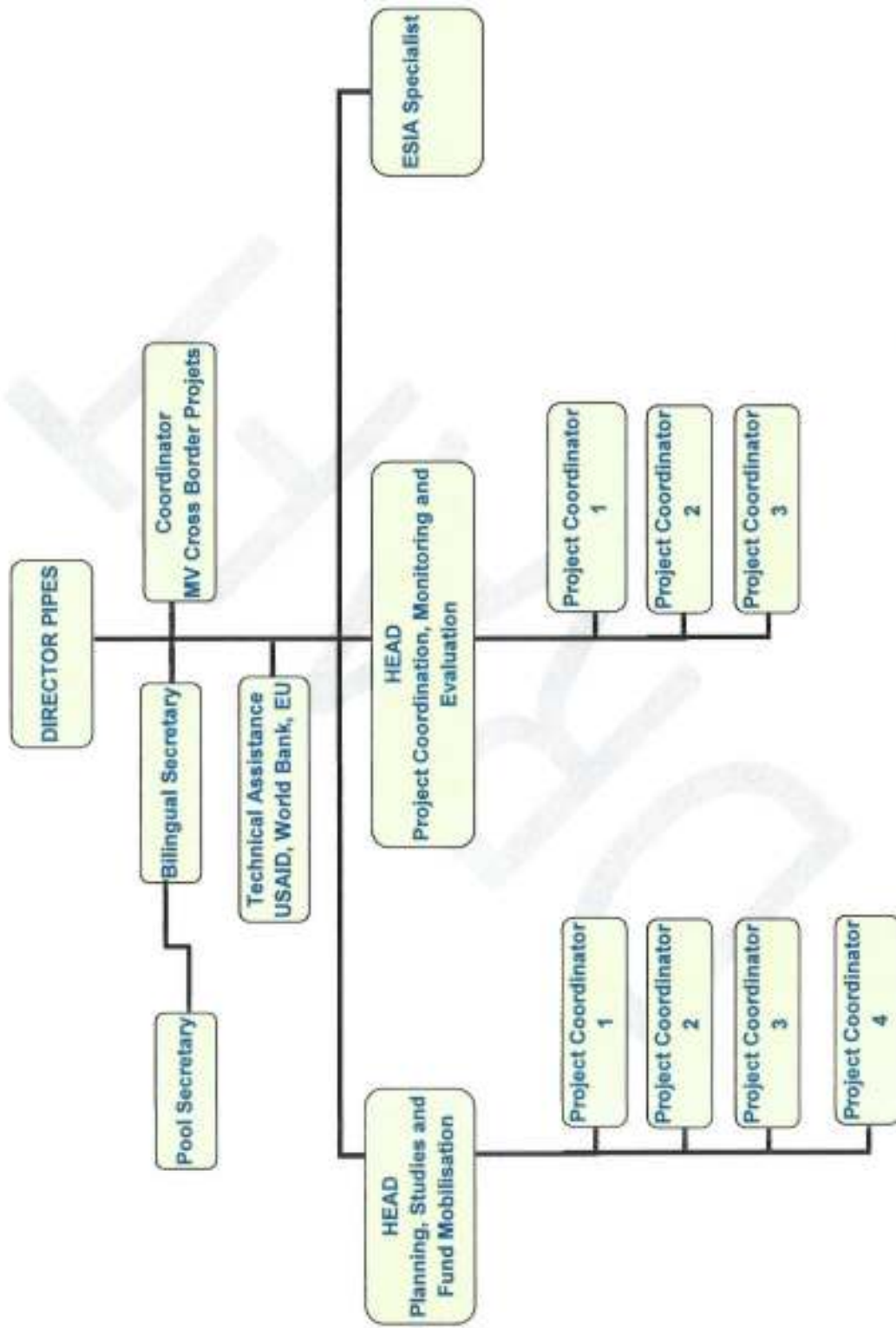
	PROJECT	ENVISAGED PIPES ACTIVITIES	EXPECTED COMMISSIONING
A	<i>Preparation of Projects</i>		
1	330 kV Cote d'Ivoire - Ghana Interconnection Reinforcement Project	Preparing Bidding Documents, Securing financing, Following up on project implementation	2019
2	225 kV Ghana - Burkina - Mali Interconnection Project	Finalizing complementary Pre-investment Studies, Securing Financing, Following up on project implementation	2020
3	330 kV WAPP Northeast Interconnection Project (Nigeria, Niger, Burkina, Togo/Benin)	Finalizing complementary Pre-investment Studies, Securing Financing, Following up on project implementation	2020
4	225 kV Guinea - Mali Interconnection Project	Finalizing Pre-investment Studies, Securing Financing, Following up on project implementation	2019
5	515 MW Souapiti Hydropower Project in Guinea	Preparing Feasibility study and Bidding Documents, Securing Financing, Following up on project implementation	2021
6	330 kV Nigeria - Benin Interconnection Reinforcement Project	Preparing Feasibility study and ESIA as well as Bidding Documents, Securing Financing, Following up on project implementation	2020
7	WAPP Solar Power Park in Burkina	Preparing Feasibility study and ESIA as well as Bidding Documents, Securing Financing, Following up on project implementation	2021
8	Master Plan for MV Cross Border Projects	Securing funding, Recruiting Consultants, Preparing and adopting Study	2017
9	300 - 665 MW Amaria Hydropower Project	Securing funding, Recruiting Consultants, Preparing Feasibility study and ESIA as well as Bidding Documents, Securing Financing, Following up on project implementation	2023
10	225 kV Cote d'Ivoire - Liberia Interconnection Reinforcement Project	Securing funding, Recruiting Consultants, Preparing Feasibility study and ESIA as well as Bidding Documents, Securing Financing, Following up on project implementation	2021
11	291 MW Grand Kinko Hydropower Project	Securing funding, Recruiting Consultants, Preparing Feasibility study and ESIA as well as Bidding Documents	2024
12	Update ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy	Securing funding, Recruiting Consultants, Preparing and adopting Study	2018
13	330 kV WAPP Median Interconnection Reinforcement Project (Nigeria-Benin-Togo-Ghana)	Securing funding, Recruiting Consultants, Preparing Feasibility study and ESIA	2026



	<b>PROJECT</b>	<b>ENVISAGED PIPES ACTIVITIES</b>	<b>EXPECTED COMMISSIONING</b>
B	<i>Coordination and/or Monitor of Implementation of Projects</i>		
1	330 kV Volta (Ghana) – Lomé C (Togo) – Sakété (Bénin) Interconnection Project	Following up on project implementation	2017
2	225 kV Bolgatanga (Ghana) – Ouagadougou (Burkina Faso) Interconnection Project;	Following up on project implementation	2017
3	161 kV Tumu (Ghana) – Han (Ghana) – Wa (Ghana) Transmission Line Project;	Following up on project implementation	2016
4	330 kV Abouadze (Ghana) – Prestea (Ghana) – Bolgatanga (Ghana) Transmission Line Project;	Following up on project implementation	2018
5	225 kV Côte d'Ivoire – Liberia – Sierra Leone – Guinea Interconnection Project;	Following up on project implementation	2018
6	225 kV OMVG Interconnection Line (Senegal, The Gambia, Guinea Bissau, Guinea)	Following up on project implementation	2019
7	225 kV Manantali (Mali) – Kita (Mali) – Bamako (Mali) Transmission Reinforcement Project under OMVS	Following up on project preparation and implementation	2019
8	3050 MW Mambilla Hydropower Project (Nigeria);	Following up on project implementation	2021
9	700 MW Zungeru Hydropower Project (Nigeria);	Following up on project implementation	2019
10	450 MW WAPP Maria Gleta Regional Power Generation Facility (Benin);	Coordinating on Project Structuring, Securing Financing, Commercial Framework, and following up on implementation	2020
11	450 MW WAPP Domonli Regional Power Generation Facility (Ghana);	Coordinating on Project Structuring, Securing Financing, Commercial Framework, and following up on implementation	2020
12	281 MW Koukoutamba Hydropower Project (OMVS - Senegal, Mali, Guinea, Mauritania)	Following up on project preparation and implementation	2020
13	220 MW Tiboto Hydropower Project (Côte d'Ivoire, Liberia);	Following up on project preparation and implementation	2021
14	147 MW Adjarala Hydropower Project (Togo, Benin);	Following up on project implementation	2019
15	140 MW Gouina Hydropower Project (OMVS - Senegal, Mali, Guinea, Mauritania);	Following up on project implementation	2019
16	125 MW OMVG Sambangalo Hydropower Project (OMVG - Senegal, The Gambia, Guinea Bissau, Guinea)	Following up on project implementation	2019
17	64 MW Mount Coffee Hydropower Project (Liberia)	Following up on project implementation	2017
18	Ghana - Southern Togo Medium Voltage Cross Border project	Coordinating project implementation	2016
19	Benin - Northern Togo Medium Voltage Cross Border project	Coordinating project implementation	2016
20	Côte d'Ivoire - Liberia Medium Voltage Cross Border project	Coordinating project implementation	2016
21	Donor Coordination Meetings	Coordinating the interventions of Donors and mobilizing funding for the development and execution of WAPP Priority Projects	
22	WAPP Strategic Planning and Environmental Committee	Evaluate and adopt program of PIPES and examine pace of implementation of WAPP Priority Projects	
23	Technical Cooperation	Reinforcing relations in the domain of power exchanges	



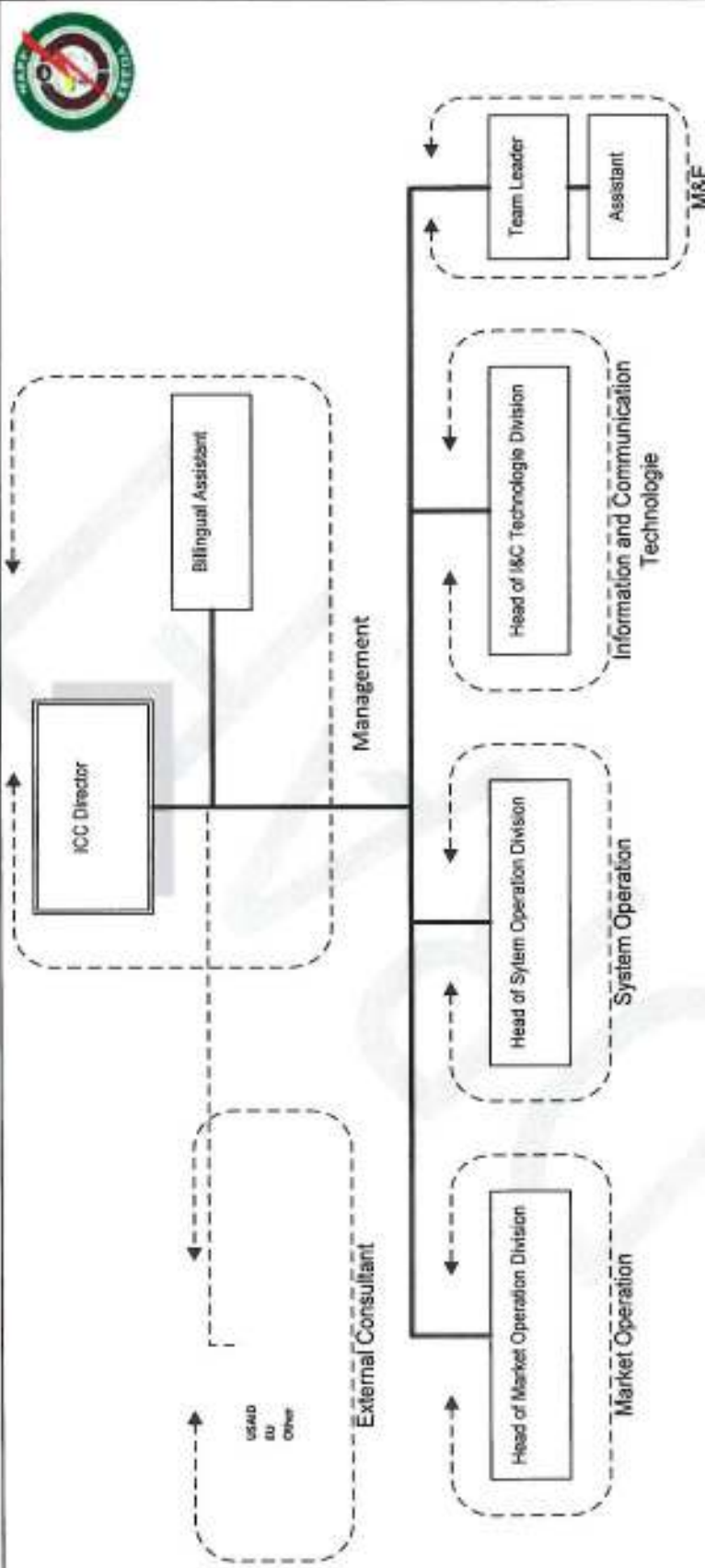
**ANNEX 5: ORGANOGRAM OF THE PIPES DEPARTMENT**



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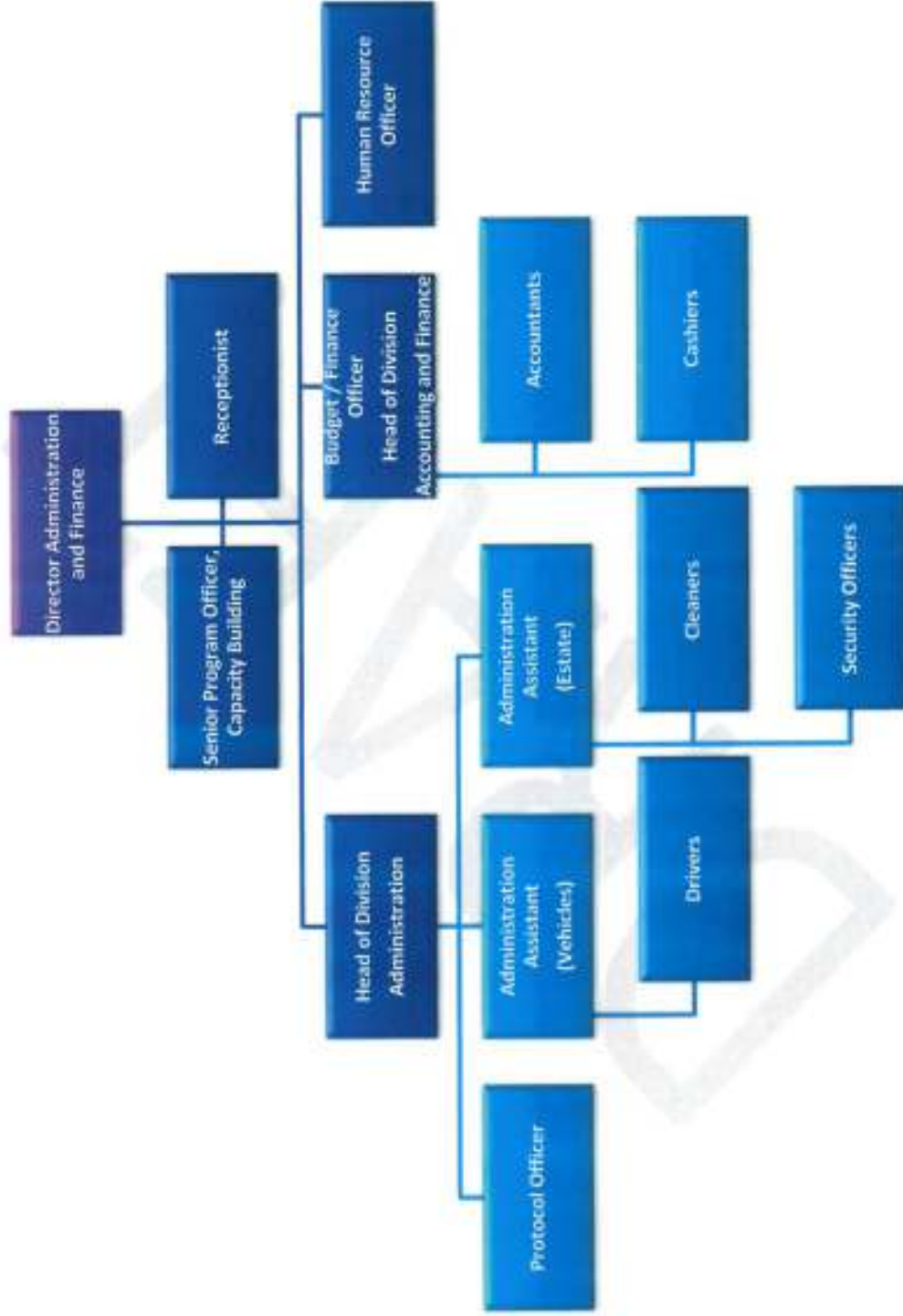
**ANNEX 6: ORGANOGRAM OF ICC/RSMO**

**WAPP – ICC – Organisation – Executive Management**



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**ANNEX 7: ORGANOGRAM OF THE ADMINISTRATION AND FINANCE DEPARTMENT**



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# **ANNEX 8: BUDGET FOR PIPES ACTIVITIES WITH REGARDS TO THE DEVELOPMENT OF PRIORITY PROJECTS**

	Priority projects	PIPES Activities*	Cost (US\$ 100ks)				Funding Requirement (US\$ '000s)		
			2016	2017	2018	2019	Required	Estimated / Secured	WAPP
1	330 kV Côte d'Ivoire - Ghana Interconnection Reinforcement Project	Preparing Bidding Documents, Securing financing, Following up on project implementation	53	5	5	5	251,100	251,100	68
2	225 kV Ghana - Burkina - Mali Interconnection Project	Finalizing complementary Pre-investment Studies, Securing Financing, Following up on project implementation	133	5	5	5	239,360	232,200	148
3	330 kV WAPP Northcore Interconnection Project (Nigeria, Niger, Burkina, Togo/Benin)	Finalizing complementary Pre-investment Studies, Securing Financing, Following up on project implementation	122	384	6	6	540,000	540,000	518
4	225 kV Guinea - Mali Interconnection Project	Finalizing Pre-investment Studies, Securing Financing, Following up on project implementation	86	5	5	5	386,100	386,100	101
5	515 MW Souapiti Hydropower Project in Guinea	Preparing Feasibility study and Bidding Documents, Securing Financing, Following up on project implementation	17	6	6	6	214,000	214,000	35
6	330 kV Nigeria - Benin Interconnection Reinforcement Project	Preparing Feasibility study and ESIA as well as Bidding Documents, Securing Financing, Following up on project implementation	71	92	5	5	139,000	139,000	173
7	WAPP Solar Power Park in Burkina	Preparing Feasibility study and ESIA as well as Bidding Documents, Securing Financing, Following up on project implementation	22	52	11	3	111,632	111,632	88
8	Master Plan for MV Cross Border Projects	Securing funding, Recruiting Consultants, Preparing and adopting Study	39	330		21	10,000	10,000	390
9	300 - 665 MW Amana Hydropower Project	Securing funding, Recruiting Consultants, Preparing Feasibility study and ESIA as well as Bidding Documents, Securing Financing, Following up on project implementation	38	40	20	3	380,500	380,500	101
10	225 kV Côte d'Ivoire - Liberia Interconnection Reinforcement Project	Securing funding, Recruiting Consultants, Preparing Feasibility study and ESIA as well as Bidding Documents, Securing Financing, Following up on project implementation	52	62	183	5	228,000	228,000	302



	Priority projects	PIPES Activities*		Cost (US\$ '000s)				Funding Requirement (US\$ '000s)			
				2016	2017	2018	2019	Required	Earmarked / Secured	Gap	WAPP
11	201 MW Grand Kinkon Hydropower Project	Securing funding, Recruiting Consultants, Preparing Feasibility study and ESIA as well as Bidding Documents	WAPP Donors			48	29				77
12	Update ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy	Securing funding, Recruiting Consultants, Preparing and adopting Study	WAPP Donors		104	338	800	800		800	442
13	330 kV WAPP Median Interconnection Reinforcement Project (Nigeria-Benin-Togo-Ghana)	Securing funding, Recruiting Consultants, Preparing Feasibility study and ESIA	WAPP Donors		350	1,050	126	1,400		1,400	242
14	330 kV Volta (Ghana) – Lomé C (Togo) – Sakété (Benin) Interconnection Project	Following up on project implementation	WAPP Donors	3	3		945	3,500		3,500	6
15	225 kV Bolgatanga (Ghana) – Ouagadougou (Burkina Faso) Interconnection Project	Following up on project implementation	WAPP Donors	5	51,150	51,150		341,000	341,000		15
16	330 kV Abouadze (Ghana) – Prestea (Ghana) – Bolgatanga (Ghana) Transmission Line Project	Following up on project implementation	WAPP Donors	33,300	44,400	33,300		111,000	111,000		12
17	225 kV Cote d'Ivoire – Liberia – Sierra Leone – Guinea Interconnection Project	Following up on project implementation	WAPP Donors	3	56,040	74,720	56,040	186,800	186,800		64
18	225 kV OMVG Interconnection Line (Senegal, The Gambia, Guinea Bissau, Guinea)	Following up on project implementation	WAPP Donors	119,000	142,800	142,800	71,400	476,000	476,000		12
19	225 kV Manantali (Mali) – Kita (Mali) – Bamako (Mali) Transmission Reinforcement Project under OMVS	Following up on project implementation	WAPP Donors	177,750	213,300	213,300	106,650	711,000	711,000		9
20	3050 MW Mambilla Hydropower Project (Nigeria)	Following up on project preparation and implementation	WAPP Donors		3	3	3				9
21	700 MW Zungeru Hydropower Project (Nigeria)	Following up on project implementation	WAPP Donors		46,500	62,000	46,500	155,000		155,000	9
					640,000	800,000	960,000	3,200,000	2,720,000	480,000	9
				325,000	390,000	195,000	130,000	1,300,000	1,300,000		



	Priority projects	PIPES Activities*	Cost (US\$ '000s)				Funding Requirement (US\$ '000s)			
			2016	2017	2018	2019	Required	Unmarked / Secured	Gap	WAPP
22	450 MW WAPP Mara-Gina Regional Power Generation Facility (DRC);	Coordinating on Project Structuring, Securing Financing, Commercial Framework, and following up on implementation	WAPP Private Partner Donors	151 1,400 432	257 2,000 432	306 2,000 366	3 130,400 26,080	3 5,400 330	617 620,520 26,650	617
23	450 MW WAPP Domani Regional Power Generation Facility (Ghana);	Coordinating on Project Structuring, Securing Financing, Commercial Framework, and following up on implementation	WAPP Private Partner Donors	63 1,400 432	126 2,000 432	157 2,000 366	32 130,400 26,080	32 5,400 330	378 620,520 26,650	378
24	281 MW Koudougou Hydropower Project (Cote d'Ivoire, Liberia);	Following up on project preparation and implementation	WAPP Donors	432 104,063	432 232,875	3 232,875	3 776,250	3 776,250	9 776,250	9
25	220 MW Tiboto Hydropower Project (Cote d'Ivoire, Liberia);	Following up on project preparation and implementation	WAPP Donors	33 94,250	5 113,100	5 113,100	5 377,000	5 377,000	48 578,000 377,000	48
26	147 MW Adjara Hydropower Project (Togo, Benin);	Following up on project implementation	WAPP Donors	3 82,250	5 98,700	5 49,350	5 329,000	5 329,000	12 377,000	12
27	140 MW Guinea Hydropower Project (Guinea, Mauritania);	Following up on project implementation	WAPP Donors	3 113,509	3 136,200	3 68,100	3 454,000	3 454,000	38 454,000	38
28	128 MW OMVG Sangha-Houma Hydropower Project (OMVG - Senegal, The Gambia, Guinea Bissau, Guinea)	Following up on project implementation	WAPP Donors	3 107,100	3 107,100	3 53,550	3 357,000	3 357,000	9 357,000	9
29	64 MW Mount Coffee Hydropower Project (Liberia)	Following up on project implementation	WAPP Donors	3 278	3 278	3 2,773	3 2,773	3 2,773	3 2,773	3
30	Ghana - Southern Togo Medium Voltage Cross Border project	Coordinating project implementation	WAPP Donors	3 278	3 278	3 2,773	3 2,773	3 2,773	3 2,773	3
31	Benin - Northern Togo Medium Voltage Cross Border project	Coordinating project implementation	WAPP Donors	3 278	3 278	3 2,773	3 2,773	3 2,773	3 2,773	3
32	Cote d'Ivoire - Liberia Medium Voltage Cross Border project	Coordinating project implementation	WAPP Donors	3 278	3 278	3 2,773	3 2,773	3 2,773	3 2,773	3
33	Donor Coordination Meetings	Coordinating the interventions of Donors and mobilizing funding for the development and execution of WAPP Priority Projects	WAPP Donors	1,344 86	86 86	86 86	86 86	86 86	344 86	344
34	WAPP Strategic Planning and Environmental Committee	Evaluate and adopt program of PIPES and examine pace of implementation of WAPP Priority Projects	WAPP Donors	88 11	88 11	88 11	88 11	88 11	352 44	352
35	Technical Cooperation	Reinforcing relations in the domain of power exchanges	WAPP Donors	11 1,120	11 984	11 984	11 984	11 984	44 984	44
36	Technical Assistance	Reinforcing the capacity of PIPES	WAPP Donors	1,120 4,871	984 1,794	984 1,794	984 1,794	984 1,794	3,323 4,871	3,323
			WAPP	4,871	1,794	481	-	-	4,871	4,871
			Private Partner	984,794	2,447,211	2,899,809	2,621,718	7,035,381	4,898,975	-
			Private Partner	2,800	4,900	4,900	280,800	1,281,440	1,281,440	-
			TOTAL	985,670	2,452,925	2,905,384	2,903,007	13,186,166	7,046,151	4,871



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**ANNEX 9: BUDGET FOR ICC/RSMO ACTIVITIES**

SPECIFIC OBJECTIVES	ICC ACTIVITIES	Duration	Cost (kUS\$)		
			Donors	WAPP	GAP
Establish a Regional Electricity Market	Implementation of the Regional Electricity Market Road Map	2016-2018	10,000	200	
	Implementation of WAPP-ICC Infrastructure Project	2016-2017	33,393	300	35,000
	Implementation of the WAPP Operation Manual	2016-2019	21,000	400	
	Establishment of RSMO Database and Website	2016-2017	2,000	200	
	Establishment of WAPP Geographical Information System WAPP-GIS	2016	2,000	100	
	WAPP-ICC Capacity Building Program	2016-2019	6,450	600	
	RSMO Certification Program	2016-2019	3,000	900	
	Implementation of the WAPP Dark Fibre Project	2016-2019	35,000	500	



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	Market Reporting	2016-2019	1,000	300	
Energy Efficiency Program of the WAPP Member Utilities:	Distribution Investment Development and Loss Reduction Program	2016-2019	4,000	200	
	Smart Grid Applications in Distribution Systems of WAPP Member Utilities	2016-2019	2,000	250	
<b>Total</b>			118,843	3,950	35,000
<b>US\$ 157,793,000</b>					



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**ANNEX 10: BUDGET FOR A&F ACTIVITIES INCLUDING CAPACITY BUILDING PROGRAM AND CENTERS OF EXCELLENCE**

**Budget Projections for 2016 – 2019 Period**

	2016 (UA)	2017 (UA)	2018 (UA)	2019 (UA)
1 Personnel Expenses	2,645,321	3,100,694	4,488,945	6,177,598
2 General Expenses	484,581	460,352	494,878	512,199
3 Administrative Expenses	765,918	804,214	832,362	861,494
4 Executive Board and Committee Meetings	826,697	806,030	834,241	863,439
5 Capital Expenses	281,657	701,731	983,731	742,357
<b>TOTAL</b>	<b>5,004,174</b>	<b>5,873,020</b>	<b>7,634,157</b>	<b>9,157,088</b>
<b>TOTAL (US\$)</b>	<b>7,160,093</b>	<b>8,403,258</b>	<b>10,923,134</b>	<b>13,102,182</b>

1 UA = US\$1.430824 (September 21, 2015)



2016 – 2019 WAPP Business Plan

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## Capacity Building Program Budget

### 1. Training Cost for WAPP Member Utilities

No	Capacity Building Component and Activities	# of Training Sessions	# of Trainees / Session	Unit Cost / Training (kUS\$)	Total (kUS\$)
1.	Training of WAPP Member Utilities				
	Electricity Market Business Processes	2	12	6	144
	Increasing Private Sector Participation and Structuring PPP in the Power Sector	2	12	6	144
	Management of Interconnected Systems (Deployment of WAPP Operations Manual)	2	12	6	144
	Power Sector Reform and Re-structuring for Women	2	12	6	144
1.1.	Training of Group I (Ghana & Nigeria)				
	Making viable Renewable Energy Projects in an Interconnected system	2	6	6	72
	Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)	2	8	6	96
	Minimizing Environmental and Social Impacts of Power Projects	2	6	6	72
	Study Tour to the Power Pools	1	10	15	150
	<b>Sub-Total for Group I Training</b>	<b>15</b>			<b>966</b>
	Power System Governance ( Unbundling, Regulation, Transmission Tariff, etc)	2	28	6	336
	Electricity Market Business Processes	2	20	6	240
	Increasing Private Sector Participation and Structuring PPP in the Power Sector	2	20	6	240
1.2.	Training of Group II (Cote d'Ivoire, Senegal, Mali, Benin, Togo, Burkina Faso, Niger)				
	Management of Interconnected Systems (Deployment of WAPP Operations Manual)	2	20	6	240
	Power Sector Reform and Re-structuring for Women	2	20	6	240
	Making viable Renewable Energy Projects in an Interconnected system	2	20	6	240



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No	Capacity Building Component and Activities	# of Training Sessions	# of Trainees / Session	Unit Cost / Training (kUS\$)	Total (kUS\$)
1.	Training of WAPP Member Utilities				
	Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)	1	28	6	168
	Minimizing Environmental and Social Impacts of Power Projects	2	20	6	240
	Study Tour to the Power Pools	1	20	15	300
	<b>Sub-Total for Group II Training</b>	<b>16</b>			<b>2 244</b>
	Power Systems Operations and Maintenance	3	24	6	432
	Managing Non-Technical Losses in Power Systems	2	18	6	216
	Project Management and Structuring	2	12	6	144
	Power System Governance (Unbundling, Regulation, etc)	2	24	6	288
	Electricity Market Business Processes	2	24	6	288
	Increasing Private Sector Participation and Structuring PPP in the Power Sector	2	12	6	144
	Management of Interconnected Systems (Deployment of WAPP Operations Manual)	2	12	6	144
	Power Sector Reform and Re-structuring for Women	2	18	6	216
	Making viable Renewable Energy Projects in an Interconnected system	2	18	6	216
	Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)	1	12	6	72
	Minimizing Environmental and Social Impacts of Power Projects	2	24	6	288
	Study Tour to the Power Pools	1	22	15	330
	<b>Sub-Total for Group III Training</b>	<b>23</b>			<b>2 778</b>
	<b>TOTAL TRAINING WAPP MEMBER UTILITIES</b>	<b>54</b>			<b>5 988</b>



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1.	Training of WAPP Member Utilities	Yearly Cost Distribution (kUS\$)				Funding Requirements (kUS\$)			
		2016	2017	2018	2019	Required	Donors		WAPP
							Secured / Earmarked	Gap	
1.1.	Electricity Market Business Processes	72	72			144	144	0	0
	Increasing Private Sector Participation and Structuring PPP in the Power Sector	72	72			144	0	144	0
	Management of Interconnected Systems (Deployment of WAPP Operations Manual)	72		72		144	144	0	0
	Power Sector Reform and Re-structuring for Women		72	72		144	0	144	0
	Making viable Renewable Energy Projects in an Interconnected system		36	36		72	72	0	0
	Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)	48	48			96	96	0	0
	Minimizing Environmental and Social Impacts of Power Projects		36	36		72	0	72	0
	Study Tour to the Power Pools		75	75		150	0	150	0
	<b>Sub-Total for Group I Training</b>	<b>264</b>	<b>411</b>	<b>291</b>	<b>0</b>	<b>966</b>	<b>456</b>	<b>510</b>	<b>0</b>
	Power System Governance (Unbundling, Regulation, Transmission Tariff, etc)	168	168			336	0	336	0
1.2.	Electricity Market Business Processes	120		120		240	240	0	0
	Increasing Private Sector Participation and Structuring PPP in the Power Sector	120		120		240	0	240	0
	Management of Interconnected Systems (Deployment of WAPP Operations Manual)		120		120	240	0	240	0
	Power Sector Reform and Re-structuring for Women		240			240	240	0	0



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1.	Training of WAPP Member Utilities	Yearly Cost Distribution (kUS\$)				Funding Requirements (kUS\$)			
		2016	2017	2018	2019	Required	Donors		WAPP
							Secured / Earmarked	Gap	
	Making viable Renewable Energy Projects in an Interconnected system	120		120		240	240	0	0
	Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)		168			168	168	0	0
	Minimizing Environmental and Social Impacts of Power Projects		120	120		240	0	240	0
	Study Tour to the Power Pools			300		300	0	300	0
	<b>Sub-Total for Group II Training</b>	<b>528</b>	<b>816</b>	<b>780</b>	<b>120</b>	<b>2 244</b>	<b>888</b>	<b>1 356</b>	<b>0</b>
	Power Systems Operations and Maintenance	144	144		144	432		432	0
	Managing Non-Technical Losses in Power Systems	108		108		216		216	0
	Project Management and Structuring	72	72			144		144	0
	Power System Governance (Unbundling, Regulation, etc.)		144	144		288		288	0
	Electricity Market Business Processes			144	144	288	288	0	0
	Increasing Private Sector Participation and Structuring PPP in the Power Sector		72	72		144		144	0
	Management of Interconnected Systems (Deployment of WAPP Operations Manual)			72	72	144		144	0
	Power Sector Reform and Restructuring for Women		108	108		216	216	0	0
	Making viable Renewable Energy Projects in an Interconnected system	108	108			216	216	0	0
	Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)		72			72	72	0	0

Training of Group III (Guinea, Sierra Leone, The Gambia, Guinea Bissau, Liberia)



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1.	Training of WAPP Member Utilities	Yearly Cost Distribution (kUS\$)				Funding Requirements (kUS\$)			
		2016	2017	2018	2019	Required	Donors		WAPP
							Secured / Earmarked	Gap	
	Minimizing Environmental and Social Impacts of Power Projects			144	144	288		288	0
	Study Tour to the Power Pools		330			330		330	0
	<i>Sub-Total for Group III Training</i>	<i>432</i>	<i>1 050</i>	<i>792</i>	<i>504</i>	<i>2 778</i>	<i>792</i>	<i>1 986</i>	<i>0</i>
	<b>TOTAL TRAINING WAPP MEMBER UTILITIES</b>	<b>1 224</b>	<b>2 277</b>	<b>1 863</b>	<b>624</b>	<b>5 988</b>	<b>2 136</b>	<b>3 852</b>	<b>0</b>

**Total Cost for the WAPP Member Utilities Capacity Building is US\$5,988,000**



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## 2. Training Cost for WAPP Secretariat

No	Capacity Building Component and Activities	# of Training Sessions	# of Trainees / session	Unit Cost / Training (kUS\$)	Total (kUS\$)
2.	Training of WAPP Secretariat				
2.1.	Office of SG	Power System Governance (Unbundling, Regulation);	3	10	6
		Power Sector-related legal Agreements (PPA, TSA, ASA, etc)	2	5	6
		Electricity Market Business Processes	3	15	6
	ICC	Management of Interconnected Systems Operations (Deployment of WAPP Operations Manual);	3	15	6
		Electricity Market Management Software	2	5	6
		Increasing Private Sector Participation in the Power Sector / Structuring Public-Private Partnerships in a Power Sector;	4	5	6
	PIPES	Making viable Renewable Energy Projects in an interconnected system	3	5	6
		Minimizing Environmental and Social Impacts of Power Projects	2	3	6
		Training on Administrative and Accounting Management	6	10	10
	DAF	Study Tours to Power Pools	1	5	15
		<b>TOTAL TRAINING WAPP SECRETARIAT</b>	<b>29</b>		<b>1 761</b>

Total Cost for WAPP Secretariat is US\$1,761,000

No	Capacity Building Component and Activities	Yearly Cost Distribution (kUS\$)				Funding Requirements (kUS\$)			
		2016	2017	2018	2019	Required	Secured / Earmarked	Gap	WAPP
2.	Training of WAPP Secretariat								
2.1.	Office SG								
	Power System Governance (Unbundling, Regulation);	60	60	60		180	0	180	0
	Power Sector-related legal Agreements (PPA, TSA, ASA, etc)		30	30		60	60	0	0
2.2.	ICC								
	Electricity Market Business Processes	90	90	90		270	270	0	0
	Management of Interconnected Systems Operations (Deployment of WAPP Operations Manual);	90	90	90		270		270	0
	Electricity Market Software		30	30		60	60	0	0
	Study Tours to the Power Pools		75			75		75	0
2.3.	PIPES								
	Increasing Private Sector Participation in the Power Sector / Structuring Public-Private Partnerships	30	30	30	30	120		120	0
	Making viable Renewable Energy Projects in an interconnected system		30	30	30	90	90	0	0
	Minimizing Environmental and Social Impacts of Power Projects	18	18			36		36	0
2.4	DAF								
	Training on Administrative and Accounting Management		200	200	200	600		600	0
	<b>TOTAL TRAINING WAPP SECRETARIAT</b>	<b>288</b>	<b>653</b>	<b>560</b>	<b>260</b>	<b>1 761</b>	<b>480</b>	<b>1 281</b>	<b>0</b>



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### 3. Development Cost of WAPP Centers of Excellence

No	Capacity Building Component and Activities	Yearly Cost Distribution (kUS\$)				Funding Requirements (kUS\$)		
		2016	2017	2018	2019	Required	Secured / Earmarked	Gap
3.	Development of WAPP Centers of Excellence							
3.1	Centre des Métiers de l'Électricité (CME) de CIE	200	150			350	350	
3.2	Akuse Center of Excellence in Ghana	30	30	30		90		90
				9 000	15 000	24 000		24 000
3.3.	CFPP Senelec Center of Excellence Cap des Biches	30	30	30		90		90
				9 000	15 000	24 000		24 000
	<b>TOTAL DEVELOPMENT OF REGIONAL CENTERS OF EXCELLENCE</b>	<b>260</b>	<b>210</b>	<b>18 060</b>	<b>30 000</b>	<b>48 530</b>	<b>350</b>	<b>48 000</b>
								<b>180</b>

**TOTAL COST FOR THE DEVELOPMENT OF WAPP CENTERS OF EXCELLENCE IS US\$48,530,000**



2016 – 2019 WAPP Business Plan



**ANNEX 11: EXPECTED OUTCOMES BY END 2019 OF OBJECTIVES UNDER PIPES**

			Project	Expected Outcome by End 2019
1	<b>Objective 1:</b>	Update ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy	Update Master Plan	ECOWAS Heads of State and Government execute Supplementary Act adopting Updated Master Plan
2	<b>Objective 2:</b>	Implement WAPP Priority Projects	330 kV Cote d'Ivoire - Ghana Interconnection Reinforcement Project	Financing secured and construction of project in progress
3			225 kV Ghana - Burkina - Mali Interconnection Project	Financing secured and construction of project in progress
4			330 kV WAPP Northcore Interconnection Project (Nigeria, Niger, Burkina, Togo/Benin)	Financing secured and construction of project in progress
5			225 kV Guinea - Mali Interconnection Project	Financing secured and construction of project in progress
6			515 MW Souapiti Hydropower Project in Guinea	Financing secured and construction of project in progress
7			330 kV Nigeria - Benin Interconnection Reinforcement Project	Financing secured and construction of project in progress
8			WAPP Solar Power Park in Burkina	Pre-investment studies completed and process to mobilise financing for project implementation launched
9			Master Plan for MV Cross Border Projects	ECOWAS Heads of State and Government execute Supplementary Act adopting Master Plan
10			300 - 665 MW Amaria Hydropower Project	Pre-investment studies completed and process to mobilise financing for project implementation launched
11			225 kV Cote d'Ivoire - Liberia Interconnection Reinforcement Project	Pre-investment studies completed and process to mobilise financing for project implementation launched
12			291 MW Grand Kinkon Hydropower Project	Pre-feasibility Study adopted by relevant authorities in Guinea
13			330 kV WAPP Median Interconnection Reinforcement Project (Nigeria-Benin-Togo-Ghana)	Funding secured to prepare project and pre-investment studies launched
14			330 kV Volta (Ghana) - Lome C (Togo) - Sakete (Benin) Interconnection Project	Project commissioned and operational
15			225 kV Bolgatanga (Ghana) - Ouagadougou (Burkina Faso) Interconnection Project;	Project commissioned and operational
16			161 kV Tumu (Ghana) - Han (Ghana) - Wa (Ghana) Transmission Line Project;	Project commissioned and operational

			Project	Expected Outcome by End 2019
17			330 kV Aboadze (Ghana) – Prestea (Ghana) – Bolgatanga (Ghana) Transmission Line Project;	Construction on 330 kV Kumasi (Ghana) - Bolgatanga (Ghana) of project in progress
18			225 kV Cote d'Ivoire – Liberia – Sierra Leone – Guinea Interconnection Project;	Construction of project in progress
19			225 kV OMVG Interconnection Line (Senegal, The Gambia, Guinea Bissau, Guinea)	Financing secured and Construction of project in progress
20			225 kV Manantali (Mali) – Kita (Mali) - Bamako (Mali) Transmission Reinforcement Project under OMVS	Financing secured and Construction of project in progress
21			3050 MW Mambilla Hydropower Project (Nigeria);	Financing secured and Construction of project in progress
22			700 MW Zungeru Hydropower Project (Nigeria);	Financing secured and Construction of project in progress
23			450 MW WAPP Maria Gleta Regional Power Generation Facility (Benin);	Financing secured and Construction of project in progress
24			450 MW WAPP Domunli Regional Power Generation Facility (Ghana);	Financing secured and Construction of project in progress
25	<b>Objective 2:</b>	<b>Implement WAPP Priority Projects</b>	281 MW Koukoutamba Hydropower Project (OMVS - Senegal, Mali, Guinea, Mauritania)	Financing secured and Construction of project in progress
26			220 MW Tiboto Hydropower Project (Cote d'Ivoire, Liberia);	Pre-investment studies completed and process to financing secured for project implementation
27			147 MW Adjarala Hydropower Project (Togo, Benin);	Financing secured and Construction of project in progress
28			140 MW Goulina Hydropower Project (OMVS - Senegal, Mali, Guinea, Mauritania);	Construction of project in progress
29			128 MW OMVG Sambangalou Hydropower Project (OMVG - Senegal, The Gambia, Guinea Bissau, Guinea)	Construction of project in progress
30			64 MW Mount Coffee Hydropower Project (Liberia)	Project commissioned and operational
31			Ghana - Southern Togo Medium Voltage Cross Border project	Project commissioned and operational
32			Benin - Northern Togo Medium Voltage Cross Border project	Project commissioned and operational
33			Cote d'Ivoire - Liberia Medium Voltage Cross Border project	Project commissioned and operational

**ANNEX 12: EXPECTED OUTCOMES BY END 2019 OF OBJECTIVES UNDER ICC**

<b><u>Planned Activity</u></b>	<b><u>Expected Outcome</u></b>
Organise ERERA-ICC meetings to elaborate, examine and adopt the required documents for the establishment of the market	All Governance documents for the functioning of the regional market adopted
Develop a Communication and Marketing Plan with the support of Specialists	A Communication and Marketing Plan developed and deployed through the media
<ul style="list-style-type: none"><li>- Collate national Regulations and verify that they facilitate trading</li><li>- Develop Regulations that facilitate trading and submit to countries for adoption</li><li>- Amend the Market Rules as well as Operations Manual and develop network access rules.</li></ul>	<ul style="list-style-type: none"><li>- National Regulations collated and verification conducted on whether they facilitate trading in a competitive market</li><li>- Regulations relating to regional trading developed and adopted by countries</li><li>- Market Rules as well as Operations Manual amended and network access rules developed</li></ul>

<u>Planned Activity</u>	<u>Expected Outcome</u>
<ul style="list-style-type: none"> <li>- Construct the ICC Building under supervision of Owners' Engineer;</li> <li>- Supply and Install equipment;</li> <li>- Acquire decision-making tools</li> <li>- Complete Factory and Site tests</li> <li>- Conduct training;</li> </ul>	<ul style="list-style-type: none"> <li>- ICC Building constructed under supervision of Owners' Engineer</li> <li>- Equipment supplied and installed;</li> <li>- Decision-making tools acquired</li> <li>- Factory and Site tests completed</li> <li>- Training conducted;</li> <li>- ICC is operational</li> </ul>



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<ul style="list-style-type: none"> <li>- Continue the implementation of the Synchronisation Project (examine and adopt contractual documents, preparation of Bidding Documents for the supply of equipment, etc.</li> <li>- Acquire appropriate tools for network study and analyses</li> <li>- Conduct studies to ensure the reliability of the network as well as supply/demand balance etc.</li> <li>- Develop technical norms and standards for the interconnected system</li> <li>- Implement the Operating Instructions as defined in the WAPP Operations Manual</li> <li>- Develop Certification Program for WAPP System Operators</li> <li>- Train WAPP System Operators</li> <li>- Revise WAPP Operations Manual</li> <li>- Assume the role of System Operator by coordinating the operation of the WAPP Interconnected System</li> <li>- Conduct training to enhance the capacities of staff from WAPP ICC and Control Area Centers</li> </ul>	<ul style="list-style-type: none"> <li>- Study results are available</li> <li>- Contractual reports are available;</li> <li>- Equipment supplied and installed</li> <li>- Tests are conclusive</li> <li>- Interconnected systems are synchronised and operations are stable</li> <li>- Tools for network analyses acquired</li> <li>- Network reliability studies conducted and Supply – Demand status evaluated</li> <li>- Certification Program for Operators developed</li> <li>- Operators are trained</li> </ul>
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<u>Planned Activity</u>	<u>Expected Outcome</u>
<ul style="list-style-type: none"> <li>- Complete the Distribution Investment Development and Loss Reduction Program</li> <li>- Implement the Investment Plans and Loss Reduction Programs in at least 3 countries</li> <li>- Organise fora to sensitise and disseminate Best Practices in the area of energy efficiency</li> </ul>	<p>Final Study Report from GOPA-INTEC is available</p> <p>Investment Plans and Loss Reduction Programs implemented in 3 countries</p> <p>Best Practices in the area of energy efficiency disseminated through fora</p>
<ul style="list-style-type: none"> <li>- Participate in sub-regional and international events relating to system operations, competitive markets, and telecommunication equipment - SCADA/EMS/MMS</li> <li>- Organiser events aimed at enhancing visibility on WAPP activities and disseminate information on the market</li> </ul>	<p>ICC has participated in in sub-regional and international events</p> <p>WAPP activities are visible through the media</p>
<ul style="list-style-type: none"> <li>- Collect data to update MIS</li> <li>- Update MIS</li> <li>- Conduct training for M&amp;E Focal Points</li> <li>- Develop and put in place a reliable database on system and market operations as well as generation, transmission and distribution facilities of WAPP Member Utilities</li> </ul>	<ul style="list-style-type: none"> <li>- Data to update MIS collected</li> <li>- MIS updated</li> <li>- M&amp;E Focal Points trained</li> <li>- Reliable database on system and market operations as well as generation, transmission and distribution facilities of WAPP Member Utilities developed</li> </ul>
Electronically archive all WAPP documents	Electronically archived WAPP documents are available

<u>Planned Activity</u>	<u>Expected Outcome</u>
<ul style="list-style-type: none"> <li>- Coordinate the signature of the Consortium Agreement by the concerned Utilities</li> <li>- Engage the Management Company for the Dark Fibre</li> <li>- Coordinate the signature of Agreement between the Management Company and the Dark Fibre Consortium</li> </ul>	<ul style="list-style-type: none"> <li>- Consortium Agreement executed by concerned Utilities</li> <li>- Management Company engaged</li> <li>- Agreement between the Management Company and the Dark Fibre Consortium executed</li> </ul>

**ANNEX 13: EXPECTED OUTCOMES BY END 2019 OF OBJECTIVES UNDER A&F**

1.	Training of WAPP Member Utilities	KPI by End 2019	
		# of Training Sessions	# of Trainees
1.1.	Training of Group I (Ghana & Nigeria)	Electricity Market Business Processes	24
		Increasing Private Sector Participation and Structuring PPP in the Power Sector	24
		Management of Interconnected Systems (Deployment of WAPP Operations Manual)	24
		Power Sector Reform and Re-structuring for Women	24
		Making viable Renewable Energy Projects in an Interconnected system	12
		Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)	16
		Minimizing Environmental and Social Impacts of Power Projects	12
		Study Tour to the Power Pools	10
		<i>Sub-Total for Group I Training</i>	<i>146</i>
1.2.	Training of Group II (Cote d'Ivoire, Senegal, Mali, Benin, Togo, Burkina Faso, Niger)	Power System Governance (Unbundling, Regulation, Transmission Tariff, etc.)	56
		Electricity Market Business Processes	40
		Increasing Private Sector Participation and Structuring PPP in the Power Sector	40
		Management of Interconnected Systems (Deployment of WAPP Operations Manual)	40
		Power Sector Reform and Re-structuring for Women	40
		Making viable Renewable Energy Projects in an Interconnected system	40
		Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)	28
		Minimizing Environmental and Social Impacts of Power Projects	40
		Study Tour to the Power Pools	20
		<i>Sub-Total for Group II Training</i>	<i>344</i>
1.3.	Training of Group III (Guinea, Sierra Leone, The Gambia, Guinea Bissau, Liberia)	Power Systems Operations and Maintenance	72
		Managing Non-Technical Losses in Power Systems	36
		Project Management and Structuring	24
		Power System Governance (Unbundling, Regulation, etc.)	48
		Electricity Market Business Processes	48
		Increasing Private Sector Participation and Structuring PPP in the Power Sector	24
		Management of Interconnected Systems (Deployment of WAPP Operations Manual)	24
		Power Sector Reform and Re-structuring for Women	36
		Making viable Renewable Energy Projects in an Interconnected system	36

1.	Training of WAPP Member Utilities	KPI by End 2019	
		# of Training Sessions	# of Trainees
	Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)	1	12
	Minimizing Environmental and Social Impacts of Power Projects	2	48
	Study Tour to the Power Pools	1	22
	<i>Sub-Total for Group III Training</i>	<i>23</i>	<i>430</i>
	<b>TOTAL KPI TRAINING WAPP MEMBER UTILITIES</b>	<b>54</b>	<b>920</b>

2.	Training of WAPP Secretariat		KPI by End 2019	
			# of Training Sessions	# of Trainees
2.1.	Office SG	Power Sector Governance (Regulation, Transmission Tariff, etc.)	3	30
		Power Sector-related legal Agreements (PPA, TSA, ASA, etc.)	2	10
2.2.	ICC	Electricity Market Business Processes	3	45
		Management of Interconnected Systems (Deployment of WAPP Operations Manual)	3	45
		Electricity Market Management / Software	2	10
		Study Tours to the Power Pools	1	5
2.3.	PIPES	Increasing Private Sector Participation and Structuring PPP in the Power Sector	4	20
		Making viable Renewable Energy Projects in an Interconnected system	3	15
		Minimizing Environmental and Social Impacts of Power Projects	2	6
2.4.	DAF	Training on Administrative and Accounting Management	6	60
		TOTAL KPI TRAINING WAPP SECRETARIAT	29	246