Update on WAPP Regional Interconnection Project

WAPIC – DAKAR
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How to Overcome the Energy Deficit in West Africa?

- Insufficient installed/available generation capacities in all ECOWAS Member States
- Supply/Demand Imbalance characterised by chronic load shedding
- High volatility in fuel prices and inadequate tariff levels

- Development of generation and interconnection facilities
  - Public Private Partnerships
  - Establishment of a regional electricity market
  - Regional institutional and regulatory framework
Sociétés Membres en 2006
(13 #)

- SOGEM
- PHCN
- SOGEPE
- Senelec
- SONABEL
- EDG
- EDM SA
- CEB
- ECG
- VRA
- SOPIE
- NAWEC
- SBEE
Sociétés Membres en 2010 (20#)

SOGEML
Société de Gestion de l’Énergie de Monastir

PHCN
Power Holding Company Of Nigeria Plc.

EDMSA

SOGEPE

SONABEL

VRA

ECG

CEB

LEC

EDG

NIGELEC

EAGB

NAWEC

CEET

SBEE

Office National de l’Electricité
Essentials of Regional Electricity Market
WAPP Priority Project – Implementation Schedule
WAPP Implementation strategy is based on realising:

- **Coastal Transmission Backbone Subprogram** (*Côte d’Ivoire, Ghana, Benin/Togo, Nigeria*).
- **Inter-zonal Transmission Hub Sub-program** (*Burkina Faso, OMVS via Mali, Mali via Côte d’Ivoire, LSG via Côte d’Ivoire*).
- **North-core Transmission Sub-program** (*Nigeria, Niger, Burkina Faso, Benin*).
- **OMVG/OMVS Power System Development Subprogram** (*The Gambia, Guinea, Guinea Bissau, Mali, Senegal*)
- **Côte d’Ivoire-Liberia-Sierra Leone-Guinea Power System Re-development Subprogram** (*Côte d’Ivoire, Liberia, Sierra Leone, Guinea*).
- **WAPP Strategic Generation Subprogram** (*Emergency Power Supply Security Plan*).
Nigeria
Niger
Senegal
Gambia
Guinea Bissau
Guinea
Côte d'Ivoire
Burkina Faso
Benin
Togo
Implementation Road Map

Coastal Trans Backbone Sub-program
Inter-Zonal Trans Hub Sub-program
North-core Trans Sub-program
OMVG/OMVS Development Sub-program
CLSG System Redevelopment Sub-program
- 225 kV Bobo Dioulasso – Ouagadougou: OPERATIONAL SINCE DECEMBER 2009
- 330 kV Abroadze (Ghana) – Volta (Ghana); IMPLEMENTATION: 2010
- 330 kV Volta (Ghana) – Lome “C” (Togo) – Sakete (Benin); IMPLEMENTATION: 2013
- 60 MW WAPP Felou Hydropower; IMPLEMENTATION: 2013
- 225 kV Bolgatanga (Ghana) – Ouagadougou (Burkina Faso); PRE-INVESTMENT: 2013
- 147 MW WAPP Adjarala Hydropower – FINANCING REQUIRED: 2014
- 330 kV Birnin Kebbi (Nigeria) - Bembereke (Benin) – Niamey (Niger) – Ouagadougou (Burkina Faso); PRE-INVESTMENT: 2014
• Cote d’Ivoire – Liberia – Sierra Leone – Guinea Interconnection Project – PRE-INVESTMENT - **FINANCING MOBILISED : 2014**

• 330 kV Aboadze (Ghana) – Prestea (Ghana) – Kumasi (Ghana) – Han (Ghana) + Tumu (Ghana) – Han (Ghana) – Wa (Ghana); PRE-INVESTMENT - **2015**

• Han (Ghana) – Bobo Dioulasso (Burkina Faso) – Sikasso (Mali) – Bamako (Mali); - **FINANCING REQUIRED : 2015**

• 330 kV Riviera (Cote d’Ivoire) – Prestea (Ghana) – PRE-INVESTMENT : **2015**

• 64 MW WAPP Mount Coffee Hydropower – PRE-INVESTMENT : **2015**
- Hydropower sites at Kaleta, Sambangalou + 225 kV Interconnection Line - IMPLEMENTATION FINANCING REQUIRED: 2015
- 225 kV Nzérékoré (Guinea) – Fomi (Guinea – Bamako (Mali); PRE-INVESTMENT: 2016
WAPP Power Plant – Update
Status of Power Supply in ECOWAS: Supply Sources

- Benin
- Burkina Faso
- Côte d'Ivoire
- Gambia
- Ghana
- Guinea
- Guinea Bissau
- Liberia
- Mali
- Nigeria
- Senegal
- Sierra Leone
- Togo

**Supply Sources**

- **Thermal**: 64%
- **Hydro**: 31%
- **Import + Others**: 5%

GWh
Status of Power Supply in ECOWAS:
Demand-Supply Balance

GWh

- Met
- Unmet

Percentages:
- Met 54%
- Unmet 46%

Countries:
- Benin
- Burkina Faso
- Cote d'Ivoire
- Gambia
- Ghana
- Guinea
- Guinea Bissau
- Liberia
- Mali
- Nigeria
- Senegal
- Sierra Leone
- Togo

Total:
- 30,170 GWh
Build three (3) regional thermal power plants at strategic locations:

- 450 MW combined cycle plant at Maria Gleta in Benin.
- 400 MW combined cycle plant at Aboadze in Ghana.
- 150 MW combined cycle plant within OMVS region.
Status:

- Authority of ECOWAS Heads of State and Government enacted fast track implementation of WAPP EPSSP in January 2008;
- Land with free-zone status secured in Benin for 450 MW Maria Gleta;
- Pre-investment studies completed for 450 MW Maria Gleta giving an estimated development cost of about US$700 million;
- Land already identified in Ghana for 400 MW Aboadze and is being secured from Government of Ghana under free-zone status;
- Location of 150 MW plant within OMVS region is being determined;
- Prequalification and Bidding Documents to secure Strategic Partner being finalised;
- Pre-investment studies for WAPP Liquefied Natural Gas Additional Fuel Facility being launched.
GAS RISK MITIGATION PLAN

Floating LNG Vessel

Natural Gas

WAGP
WAPP ICC PROJECT
Towards the realization of WAPP Electricity Market

NEXT PHASE

IMPLEMENTATION OF OSMP
Implement identified gaps

IMPLEMENTED PROPOSED DESIGN OF ICC
Case Study

WAPP M&E/MIS System On-going

Negotiation stage

Construct the WAPP ICC Building

Implement Web SCADA system

PROJECTS AWAITING IMPLEMENTATION

REALIZATION OF WAPP ELECTRICITY MARKET

USAIN FUND
WAPP FUND
KOREA GOVT.
USAIN FUND
WORLD BANK
WAPP FUND
KOREA GOVT.
NA

Operation Security & Mitigation Plan
Gap Analysis
Feasibility Studies & Basic Design of ICC
WAPP Tariff Methodology
WAPP M&E/MIS System
Market Rules & Market design
Architectural Design of WAPP ICC Building
Web SCADA Project
Communication Infrastructure (Geographical)

Legend
- WAPP Information & Coordination Center
- Control Area Center
- National Control Center
- Communication Link

KEPCO project was based on realizable communication Links in the WAPP Priority Projects

Web SCADA is independent on this Communication
WEB SCADA

(Interim and Backup Power Monitoring solution for the operations of WAPP ICC)
WEB SCADA- BENEFITS

- Not dependent on completion of interconnection
- Back-up WAPP Control Center
- No SCADA control center/room associated costs;
- Very low capital & operating costs in comparison to other solutions;
- Fast to install and easy to maintain and support;
- Use of the existing infrastructure of high quality digital communications;
- Flexible and scalable to add project-specific features;
- Secure accessibility from anywhere anytime using web browsers;
WAPP ICC BUILDING
WAPP ICC Building

WAPP Information & Coordination Center
PROPOSED DESIGN
THANK YOU

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