WEST AFRICA ENERGY PROGRAM

WEST AFRICA REGIONAL ACTIVITIES (CLIN 0001)

YEAR 4 – FY 23 ANNUAL REPORT

OCTOBER 2022 - SEPTEMBER 2023

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IDIQ Contract No. 720-674-18-D-00003 Power Africa Extension (PAE)

Task Order No. 720-674-19-F-00008 West Africa Energy Program (WAEP)

Task Order Contracting Officer's Representative (CLIN 0001): Michael Oppong-Adjei

Submitted: October 30, 2023

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Cover photo by Power Africa

Acronyms

Acronym	Definition
A/S	Ancillary/Services
AER	Agence d'Electrification Rurale
AfDB	African Development Bank
AMI	Advanced Metering Infrastructure
ARE	Electricity Regulatory Authority
AT2ER	Agence Togolaise d'Electrification Rurale et des Energies
ATC&C	Aggregate, Technical Commercial and Collection
BESS	Battery Energy Storage System
CAC	Control Area Centers
CAIDI	Customer Average Interruption Duration Index
CEET	Compagnie Energie Electrique du Togo
CEO	Chief Executive Officer
CIE	Compagnie Ivoirienne d'Electricité
CI-Energies	Energies de Côte d'Ivoire
CLIN	Contracting Line Item Numbers
CLSG	Côte d'Ivoire-Liberia-Sierra Leone-Guinée
CO_2	Carbon dioxide
CO	Contracting Officer
COP	Chief of Party
COR	Contracting Officer's Representative
COVID-19	Novel Coronavirus Disease 2019
DFC	Development Finance Corporation
DFI	Development Finance Institutions
DGE	Direction Générale de l'Energie
DGRE	Direction Générale des Ressources Énergétiques
DRC	Democratic Republic of Congo
DtP	Desert to Power
E&S	Environmental and Social
ECOWAS	Economic Community of West African States
ECREEE	ECOWAS Centre for Renewable Energy & Energy Efficiency
EDG	Electricité De Guinée
EDSA	Electricity Distribution and Supply Authority

ELECTRA	Empresa De Electricidade E Agua, SA
EMMP	Environmental Mitigation and Monitoring Plan
ENEO Cameroon S.A.	Energy of Cameroon
ER	Expected Results
ERERA	ECOWAS Regional Electricity Regulatory Authority
ESIA	Environmental and Social Impact Assessment
ESWLI	Energy Sector Women Leadership Initiative
EU	European Union
FMO	Dutch Entrepreneurial Development Bank
FY	Fiscal Year
GDP	Gross Domestic Product
GIS	Geographic Information System
GtP	Gas to Power
GPC	Gabon Power Company
ICC	Information Communication Centre
IDIQ	Indefinite Delivery, Indefinite Quantity
IPP	Independent Power Producer
IRENA	International Renewable Energy Agency
IRP	Integrated Resource Planning
IsDB	Islamic Development Bank
KM	Kilometer
Kwh	Kilowatts per hour
LEC	Liberia Electricity Corporation
LNG	Liquefied Natural Gas
LoP	Life of Program
LV	Low Voltage
MEL	Monitoring, Evaluation, and Learning
MoE	Ministry of Energy
MW	Megawatt
NAST	Needs Assessment Survey Tool
NRECA	National Rural Electric Cooperative Association
OC	Outcome
OMVG	Gambia River Basin Development Organization
OMVS	Senegal River Basin Development Organization

OPGW	Optical Ground Wire
PA	Power Africa
PACO	Power Africa Coordinator's Office
PAOP	Power Africa Off-Grid Program
PADAES	Projet d'Amélioration de l'Accès à l'Electricité au Sénégal
PAIS	Power Africa Information System
PASET	Projet d'Appui au Secteur de l'Energie électricité au Tchad
PEDECEL	Projet d'Electrification et de Développement des Connexions à l'Électricité
PEPT	Programme Électricité Pour Tous
PESRM	Power Africa Environmental and Social Review Methodology
PERACE	Rural Access Project for Underserved Regions
PMO	Program Management Office
PMU	Project Management Unit
PPA	Power Purchase Agreement
PPP	Public Private Partnership
PV	Photovoltaic
PUE	Productive Use of Energy
Q	Quarter
RANA	Improvement of Access to Electricity
RGS	Domestic Gas Network of Senegal
RoC	Republic of Congo
SAEP	Southern Africa Energy Program
SBEE	Société Béninoise d'Energie Electrique
SHS	Solar Hole System
SNEL	Société Nationale d'Electricité
SONABEL	Société Nationale d'électricité du Burkina Faso
SOW	Statement of Work
SRTL	Senior Regional Technical Lead
STEM	Science, Technology, Engineering, and Mathematics
STTA	Short Term Technical Advisor
TBD	To be determined
TBI	Tony Blair Institute
TO	Task Order

TOCOR	Task Order Contracting Officer's Representative
TRANSCO CLSG	Transmission Company Côte d'Ivoire, Liberia, Sierra Leone and Guinée
TSO	Transmission System Operators
TWh	Terawatt Hour
USAID	United States Agency for International Development
USG	United States Government
USTDA	United States Trade and Development Agency
WADB	West African Development Bank
WAEP	West Africa Energy Program
WAPGP	Western Area Power Generation Project
WAPP	West Africa Power Pool
WEC	Women Energy Champion
Y	Year

Contents

LIST OF TABLES

TABLE OF FIGURES

PROGRESS TOWARD LIFE-OF-PROGRAM TARGETS

Project Name	West Africa Energy Program CLIN 1 (WAEP Regional)
Performance Period	July 15, 2019, to July 14, 2024
TEC	$54,581,750
Countries	Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, the Gambia, Ghana, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, São Tomé and Príncipe, Senegal, Sierra Leone and Togo.
Implementing Partner	Deloitte Consulting LLP
Subcontractors	Deloitte Afrique, EnerNex, CrossBoundary, Deloitte/Ghana, NRECA
Performance Reporting Frequency	Quarterly
Date of Latest PMP Modification	December 15, 2020
Contacts	COP: Adaku Ufere; A/COP: Brent Hampton
	COR: Michael Oppong-Adjei

WAEP RESULTS AS OF: September 30, 2023

Project Goals	LOP Target	Progress to Date (as of 09/30/2023)	% Achieved (against LoP)
Number of new grid and off-grid actual direct connections (PA #3) **Number of new grid and off-grid anticipated direct connections at financial close (PA #2)**	3.5 million	2,739,199	78.2 %
Number of MW from transactions that achieved financial close (PA #8)	8,000 MW	1,977 MW	25%
Amount of investment mobilized for energy investment (PA #14)	N/A	$5.808.5B	-
Kilometers of Power Lines Constructed or Rehabilitated (PA #19)	3,800 kms	3,711	98%
Number of laws, policies, regulations or standards to enhance energy sector governance formally proposed, adopted or implemented (PA #23)	35	26	74%
Wholesale cost of generation reduced by 20% in at least three countries, disaggregated by country and normalized by international fuel price	3 countries	3 countries	100%
Master plans pertaining to generation and transmission, and/or integrated resource plans completed for seven countries	7 countries	3 countries	43%
Women in energy sector leadership roles (PA #24)	20	11	55%

Regional power utility trade relationships	2	7	350%

ENGAGEMENT WITH USG AGENCIES, POWER AFRICA PARTNERS, DONORS AND OTHERS

In Year 4, the WAEP team continued to engage and collaborate with United States Agency (USG) agencies, Power Africa partners and other stakeholders. The following table provides an overview of engaged agencies and partners with details included in the body of this report. Refer to Appendix I for more information about the engagement with partners under each category (Interagency and Development/Donor partners).

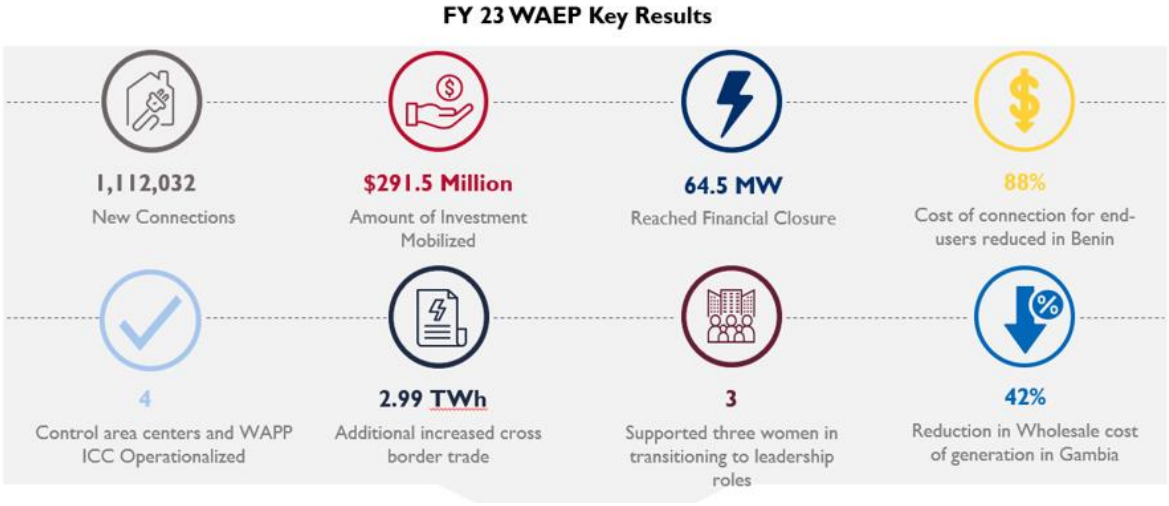
Overview of Engaged Partners, Agencies and Companies in Year 4

POWER AFRICA PARTNERS		DONORS/ DEVELOPMENT ORGANIZATIONS (OTHER)
INTERAGENCY PARTNER	DEVELOPMENT PARTNER	
Commercial Law Development Program (CLDP)	IRENA/AfDB (DtP)	
USTDA	Islamic Development Bank (IsDB	

EXECUTIVE SUMMARY

In Year 4 of the United States Agency for International Development (USAID) funded Power Africa West Africa Energy Program ("WAEP" or "the Program"), the Program deepened its reach across the region, collaborating closely with stakeholders and partners to strengthen electrification projects across the region, improve connectivity and improve utility efficiencies.

Below is an overview of the Program's key events, milestones, and achievements over the twelve-month period covered in the Report:



- **Facilitated 1,112,032 New Connections across the region** (Democratic Republic of Congo, Benin, Cameroon, Côte d'Ivoire, Senegal, Sierra Leone, Togo, Liberia) in Year 4, through transaction advisory, capacity building, and technical assistance support to utilities, ministries, rural electrification agencies, and regulators.
- **WAEP cross-border technical assistance has recorded a total of 7 power utility trade relationships strengthened, exceeding its LoP target by 350%.** Through ongoing support in aligning the Gambia River Basin Development Organization (OMVG) Grid Code with the West Africa Power Pool (WAPP) Regional Grid Code, project management and GIS training, **the WAEP team has facilitated the strengthening of additional regional power utility trade relationships** between the utility, Electricité de Guinée (EDG) and utilities in four other OMVG member countries – Guinea, Guinea-Bissau, Senegal, and Gambia.
- **Met the LoP target by reducing the cost of connections for end-users by 88% in Benin**, from 85,000 FCFA to 10,000 FCFA, via support to the Ministry of Energy (MoE), providing high-level technical assistance in validating the National Electrification Strategy and National Electrification Plan.
- **Met the LoP target by reducing the wholesale cost of power generation by more than 40%**. Through the WAEP team's technical support to OMVG, the governments of Senegal and Gambia signed an agreement that reduced the wholesale cost of power generation in Gambia by more than 40%.
- **Adding 24MWs of clean energy in Togo to help the Blitta Phase III project reach financial close**. The WAEP team provided transaction advisory assistance and support on project finance modeling to AT2ER to help address specific challenges they faced with the Blitta Phase III and Awadjelo project in the final stages of negotiation. This support helped Blitta Phase III reach financial close.

- **The Program provided technical assistance to the government of Senegal to prepare its energy transition strategy** to access appropriate financing to leverage natural resources for greater penetration of renewable energy in the power mix, embracing the best route towards decarbonization. Similarly, the WAEP team also successfully provided a review of the financing landscape for leaders in Benin as it relates to that country's energy transition.
- **Supported the construction of 1,387 km of regional transmission lines** through technical assistance provided to regional utilities, including segments from the OMVG and Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS) interconnected networks. In total, the Program has supported the commissioning of 3,711 km across the region and is expected to reach its LoP target of 3,800 kms in Year 5. Support provided has facilitated the **operationalization of two additional high priority regional projects**.
- **Recorded an additional 2.99-Terawatt hours (TWh) of increased cross border trade** through ongoing technical assistance provided to TRANSCO Côte d'Ivoire-Liberia-Sierra Leone-Guinée (CLSG), OMVS and OMVG in project management and monitoring.

- Supported the Liberia Electricity Company (LEC) on revenue management and distribution concession to improve utility efficiency and minimize losses. LEC recorded that the **average time required for LEC to connect a new end user to the grid has dropped by 67%**, from 3 months to 1 month.
- **Three women have attributed their professional growth and transition to leadership roles,** in part, due to the skills and knowledge gained through participation in the Program's Energy Sector Women in Leadership Initiative (ESWLI) workshop. Within the Liberia Electricity Company (LEC) one former participant has advanced her role in the Environmental and Health department, while another LEC employee leads Gender specific work at the company. Over in Sierra Leone, a former participant has founded the Women in Energy Sierra Leone.

- **Facilitated the official proposal and adoption of the 'Fonds Tinga' policy initiative** to support Togo's Universal Access Program. Relatedly, the team assisted Togo's MoE with guidance on seven key documents to make a strong case for possible investments in the initiative. The implementation of the policy initiative will contribute to 30,000 new connections in Togo.

- **Supported Desert to Power (DtP) in mobilizing $188 million** for two flagship projects in Niger and Chad. These projects will enable the construction of **an additional 40.5 MW of solar capacity**, 156,864 new connections and/or improved connections, and 2,759 kilometers of distribution lines.

- **Collaborated with the International Rescue Committee (IRC) Pro-Jeunes Project to provide vocational training for Ivorian women,** along with mentoring sessions, helping to match students with female mentors in the energy sector. The team also conducted a feasibility study that is supporting the construction of a 25 kW Solar Power Plant. The WAEP Country Manager in Côte d'Ivoire received an award from the IRC, on behalf of the Program, recognizing the WAEP team's support in the implementation of the Pro-Jeunes project.

1. INTRODUCTION

1.1 PROGRAM OVERVIEW

The United States Agency for International Development (USAID) funded Power Africa West Africa Energy Program ("WAEP" or "the Program") advanced its objective of expanding supply of and access to affordable and reliable grid-connected electricity services in West Africa. The Program has the ultimate goal of advancing development priorities, including inclusive economic growth, increased security, and improved health and education. Progress toward this goal is outlined in the Power Africa Roadmap, which functions as the master plan that describes how Power Africa, and its partners will fulfill its objectives.

The Program comprises two components delineated by two Contracting Line-Item Numbers (CLINs) respectively for the **West Africa Region** (CLIN 0001) and **Ghana** (CLIN 0002). The Program will collectively provide a range of technical assistance, capacity building, and transaction support to advance Power Africa's objectives in the West Africa region.

WAEP's contract scope in West Africa is to increase electricity availability and access in the region while objectively quantifying and measuring progress towards four key Outcomes as follows:

1. Increased Supply of Power
2. Access to Reliable and Affordable Grid-Based Power Increased
3. Performance of National Utilities and Power Sector Entities Improved
4. Establishment of a High-Functioning Regional Power Market Accelerated

Power Africa is a U.S. Government-led partnership that harnesses the collective resources of over 170 public and private sector partners to double access to electricity in sub-Saharan Africa.

Power Africa's goal is to add at least 30,000 megawatts (MW) of cleaner and more reliable electricity generation capacity and 60 million connections by 2030.

Since 2013, Power Africa has delivered first-time electricity to 158.9 million people across sub-Saharan Africa and connected more than 32 million homes and businesses to on- and off-grid energy solutions.

Through Power Africa assistance, 145 power projects reached financial close, representing nearly 14,000 megawatts (MW). Of these, 83 are now online and generating more than 6,200 MW of cleaner and more reliable electricity, helping to mitigate climate change and end energy poverty on the continent.

The WAEP team is working to achieve these Outcomes (OCs) by strategically aligning energy reform and electrification goals, with new investment opportunities. This will include working to bring transactions to financial close, coordinating with the private sector, prioritizing the most viable projects, and building human and institutional capacity within targeted priority utilities, government and regional institutions. Over the course of the Program's implementation, the WAEP team will increase electricity availability and access in West Africa while objectively quantifying and measuring progress against the four key Outcomes through these corresponding expected results (ERs):

OUTCOME 1 – Increase Supply of Power

- 8,000 megawatts (MW) of new generation capacity reach financial close
- 3,800 kilometers (km) of new transmission lines commissioned
- Wholesale cost of generation reduced by 20 percent in at least three countries, disaggregated by country, and normalized by international fuel price
- Master plans pertaining to generation and transmission, and/or Integrated Resource Plans (IRPs) completed for seven countries

OUTCOME 2 – Access to Reliable and Affordable Grid-Based Power Increased

- 3.5 million on-grid connections (including new and regularized)

- Reduced average cost to the utility (or other entity as appropriate) per connection in at least two countries
- Reduced upfront cost of connection for end-users in at least two countries
- Reduced average time required to get a household connection in at least three countries

OUTCOME 3 – Performance of National Utilities and Power Sector Entities Improved

- Aggregate technical and commercial distribution losses reduced in at least three utilities
- Cost recovery improved in at least two utilities
- Technical performance improved (in terms of reduced frequency and duration of outages) in at least two utilities
- Capacity of utilities and regulators to independently develop, advocate for, and approve cost reflective tariff rates improved

OUTCOME 4 – Launch of a Regional Power Market Accelerated

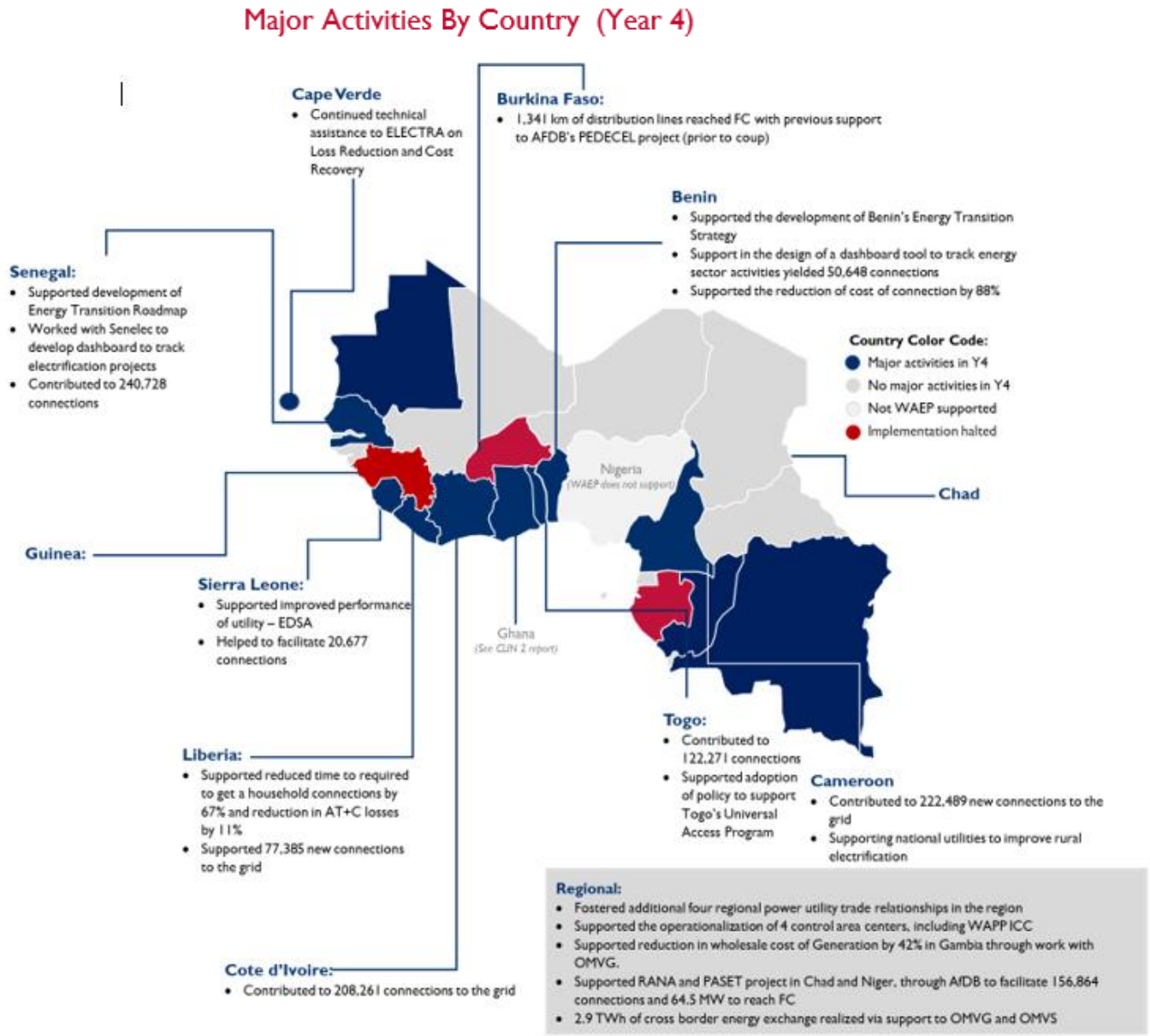
- Six high priority regional transmission projects operationalized
- West African Power Pool (WAPP) Information and Coordination Center (ICC) operationalized
- Five control area centers operationalized
- Increased number of utilities engaged in regional trade

This report reflects the Program's activities in the **West Africa Region per the CLIN 1 outcome areas**.

2. YEAR 4 KEY ACTIVITIES

In Year 4, the Program continued to collaborate with national ministries, utilities, transmission and distribution companies, regulators and the private sector. Figure 1 gives an overview of major Year 4 activity highlights by country.

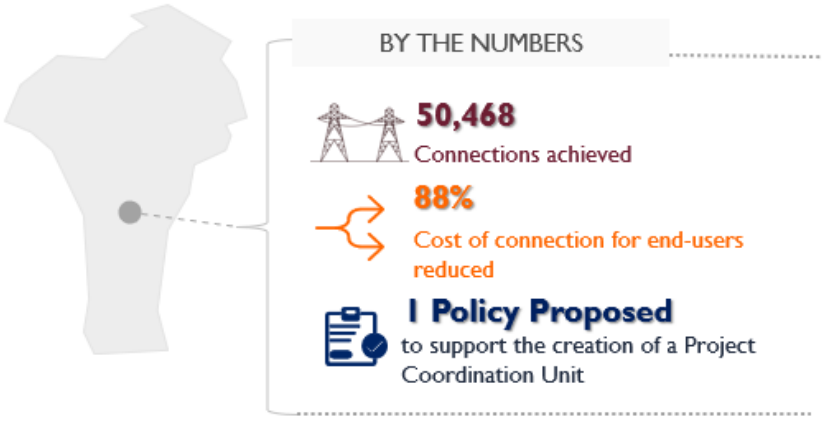
Figure 1: Overview of some of WAEP's Major Activities in West Africa



2.1. COUNTRY LEVEL ACTIVITIES

2.1.1. BENIN

[1]



OUTCOME HIGHLIGHTS

Outcome 1

Technical Assistance towards Development of the Energy Transition/Decarbonization Strategy: In Year 4, the WAEP team continued its support to Benin's Ministry of Energy (MoE) in developing its Decarbonization Strategy. The strategy highlights (i) the evolution of the energy mix in West Africa, considering the energy needs to meet overall power demand (ii) the role and prospects of natural gas for electricity generation (iii) traditional sources of financing for thermal projects (iv) the context of climate change and support for fossil fuels and (v) the funding criteria to support decarbonization in the power sector. Following the submission of the first draft in December 2022, the team received feedback from MoE, particularly the Direction Générale des Ressources Energétiques (DGRE) earlier in 2023. The report includes detailed recommendations for the country's innovative decarbonization strategy. The recommendations, once implemented, will ensure that, in the long-term, the country's gas infrastructure can serve as a catalyst for the development of renewable energy, including renewable gas.

Outcome 2

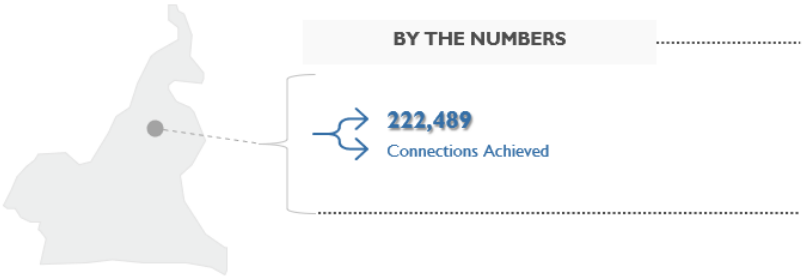
Support to DGRE in Strengthening National Power Sector Coordination and Universal Electrification (PEPT) Roll-Out yields 50,468 Connections: Following the success of the dashboard development work in Côte d'Ivoire, the WAEP team sought to regionalize its approach in subsequent years, supporting utilities across the region to efficiently track its connections efforts. This year, the WAEP team continued work with Benin's DGRE, started in Year 3, to develop a dashboard tool and establish a project coordination unit to effectively manage its connections and infrastructure projects and further strengthen Benin's National Electrification Strategy. In the establishment and maintenance of an effective project coordination unit, the WAEP team developed a concept note with recommendations and guidance on different domains associated with establishing an effective coordination unit namely: structure and governance of the unit, roles and responsibilities, interaction with implementing entities (data collection, reporting, etc.), resources, qualifications.

The WAEP team worked closely with key DGRE staff to develop a connections and energy infrastructure dashboard and, to ensure sustainability, will provide training on the use of the dashboard in the first Quarter of Year 5.

As a result of ongoing capacity building support provided to the DGRE to enhance universal access to electricity efforts, the WAEP team helped to facilitate an additional 50,468 connections.

Technical Support to Ministry of Energy Results in the Reduction of Cost to Connect for End-User in Benin by 88%: The WAEP team provided technical assistance to the MoE, in the process of building out Benin's National Electrification Strategy. WAEP's high-level advisory technical assistance contributed to the validation of this strategy, as well as Benin's National Electrification Plan that will inform over 500,000 connections through 2030. This strategy and plan provide for a reduction of upfront connection costs, as they represent an obstacle to electricity access, particularly for low-income households. This year, the upfront cost of connection for the end-user has been reduced by 88 percent, from 85,000 FCFA to 10,000 FCFA.

2.1.3. CAMEROON



OUTCOME HIGHLIGHTS

Outcome 2

Large-Scale Electrification Assistance in Cameroon Yields 222,489 New Connections: In Year 4, the WAEP team continued assistance to the Rural Electrification Agency (AER) and the utility Eneo Cameroon S.A. to enhance their capacity for electrification planning and implementation. This work is in support of the implementation of Cameroon's Rural Access Project for Underserved Regions (PERACE), which seeks to connect 250,000 new customers to electricity by 2025, as well as other electrification projects. The WAEP team provided capacity building and technical support to AER and Eneo on the use of Geographic Information System (GIS), to improve electrification planning, asset location and field data collection, therefore directly contributing to connections efforts and utility costs optimization. Following this, AER is considering creating a GIS department to apply GIS technology to improve Cameroon's electrification status and energy infrastructure. AER has recently notified WAEP that they have included the creation of this GIS team as part of their plan and budget for 2024.

AER, ENEO, ARSEL participants

The WAEP team also provided capacity building on prepayment systems, prefabricated MV/LV stations and PTC transformers. This work was greatly appreciated by the counterparts, as they are currently in the process of procuring prepayment meters for ongoing electrification projects. They noted that the

training would "improve managerial decision-making in the metering field" and "customer satisfaction through raising awareness on the importance of prepayment".

Through ongoing support provided to AER and Eneo, the Program has helped to facilitate an additional 222,489 new connections.

2.1.4. CAPE VERDE

OUTCOME HIGHLIGHTS

Outcome 3

Technical assistance on Loss Reduction and Cost Recovery to ELECTRA: The WAEP team, continued its support to Empresa De Electricidade E Agua, SA (ELECTRA) in restructuring its loss reduction department to reduce losses and enhance the prospects for debt reduction and mitigation. In Year 4, the WAEP team trained the ELECTRA commercial, losses, and energy distribution departments on developing structured strategies, plans and actions to combat commercial energy losses and recover customer debts.

The WAEP team also conducted a field mission to Santiago Island and St. Vincente Island to assess the situation on the ground and identify common issues for loss reduction and customer debt recovery, collecting the data necessary for the development and implementation of an action plan to tackle technical, commercial, and collection losses. The plan includes information on international best practices for loss reduction and cost recovery to assist ELECTRA in implementing an efficient strategy to improve its performance in the domain. The WAEP team is supporting ELECTRA to implement the action plan in selected locations. ELECTRA is now monitoring its loss indicator month by month to evaluate the evolution of the indicator and impact of the new actions and ELECTRA hopes to achieve a process of sustainable reduction of its losses. The team is currently assessing the data in full and expects to enable reporting in Year 5.

The WAEP team with representatives ELECTRA in Cape Verde

The WAEP team will continue to supervise the action plan's implementation to ensure success.

2.1.5. CÔTE D'IVOIRE

OUTCOME HIGHLIGHTS

Outcome 1

Strengthening the Solar PV Space via Support to Direction Générale de l'Energie (DGE): The WAEP team assisted the public sector, specifically the DGE and CI-ENERGIES, in developing a preliminary financial model for a hypothetical 50 MW solar project in Côte d'Ivoire. Additionally, the WAEP team conducted desktop research to assess the impact of the recent increase in project development and financing costs on the potential tariff implications. The WAEP team collaborated with Deloitte Côte d'Ivoire in preparing a fiscal regime analysis report accessible to solar energy project developers and presented to the Director General of Energy. To ensure the DGE team have the necessary skills to take ownership of the financial model, the WAEP team delivered training to strengthen their ability to conduct fiscal regime analyses and financial models review. The work will help DGE to advance the negotiation with Independent Power Producer (IPPs) in the solar PV space which is expected to yield around 200MW.

Outcome 2

208,261 Connections yielded as a Result of Technical Assistance to Compagnie Ivoirienne d'Électricité (CIE) For PEPT impact evaluation as part of the "Connections Plus Activity: The WAEP team's ongoing support to CIE on the Programme Électricité Pour Tous (PEPT – "*Electricity for All Program*"), as part of Connexions Plus, and previous GIS support to CI-Energies, yielded a total of 208,261 new connections recorded in Year 4. Therefore, to wrap up the Program's support to Connexions Plus, in Year 4, the WAEP team conducted an impact assessment of PEPT. This impact evaluation study builds on a previous study conducted by CIE in 2019 and includes a detailed assessment of the economic and social impacts of PEPT on beneficiaries.

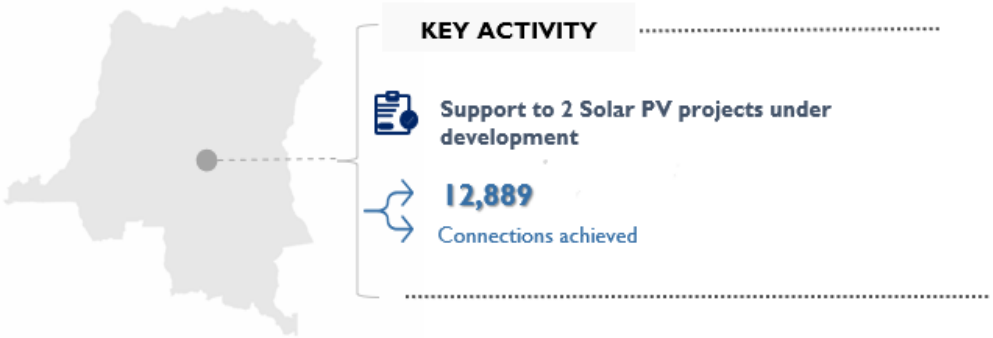
As part of the study, the team conducted a customer behavior analysis and developed a macroeconomic analysis report, based on existing data given by CIE. The customer behavior analysis presents a descriptive examination of the PEPT customer portfolio, including the energy purchasing behavior of these customers, and debt repayment behavior (as PEPT customers gradually reimburse their connection fees when paying for energy). CIE expressed great satisfaction with the customer behavior analysis report, acknowledging the depth and accuracy of WAEP's analysis. The macroeconomic analysis gives the impact of the PEPT on the Gross Domestic Product (GDP) and on the Ivorian economy in general. This analysis demonstrates

that between 2014 and 2035, the PEPT would create wealth of 1,082 billion FCFA (USD 1.8 billion) and 16,037 full-time jobs for the Ivorian economy. Furthermore, the dashboard developed as part of the customer behavior analysis, was handed over to CIE at the end of Quarter 3 this year.

Following this first phase of study, the WAEP team, in collaboration with CIE and the Ivorian data collection vendor, Axes Marketing, collected primary data from more than 2,500 households and 1,000 business PEPT customers across Côte d'Ivoire to provide valuable data for analysis. This data informed the development of the preliminary analysis report which highlights the salient statistics of the study, focusing on client satisfaction, energy consumption, health and security, education, employment, entrepreneurship and productive use, and gender equality. The data showed that most PEPT customers are satisfied with the program - as 97 percent of households and 94 percent of businesses surveyed deemed the PEPT to be "a good or very good program". The study also showed, among other findings, that one in every six households created a commercial activity following their connection to the electricity grid. Women are responsible for most of these activities, as between 177,358 and 180,706 women have set up a home-based business since the launch of PEPT. As a reference, 1,392,557 clients have been connected to the grid since 2014, via the PEPT (1,392,557 households and 12,190 businesses).

The final deliverable as part of this activity is the micro impact analysis and socio-economic report, which will present an overall analysis based on data from both CIE and the field. This report, once approved by CIE, will be the last deliverable of the PEPT impact evaluation study. It will be followed by an in-person restitution workshop, scheduled for November 8-9, 2023, in Abidjan.

2.1.6. DEMOCRATIC REPUBLIC OF CONGO (DRC)



OUTCOME HIGHLIGHTS

Outcome 1

Technical Assistance to Develop 265.2MW Solar PV Projects: Project Sponsor, East African Power, is developing two utility-scale solar PV projects in Democratic Republic of Congo (DRC), Kolwezi and Likasi. The sponsor has negotiated 20 years of PPAs with Société Nationale d'Electricité (SNEL). The WAEP team supported the project sponsor to review project concession agreements and draft PPAs. Technical assistance could allow elevating the technical feasibility studies to a bankable level. Additionally,

it could help to secure PPAs with international mining companies operating in/around the project sites to diversify the off-taker risk. These projects are expected to reach financial close in 2024.

Outcome 2

Electrification Capacity Building provided to Key Stakeholders in the DRC and Republic of Congo (RoC) Yielding 12,889 Connections: In Year 4, the WAEP team expanded support to some Central African countries, including the DRC and RoC to bolster connections in the region. The WAEP team provided technical assistance on the following topics.

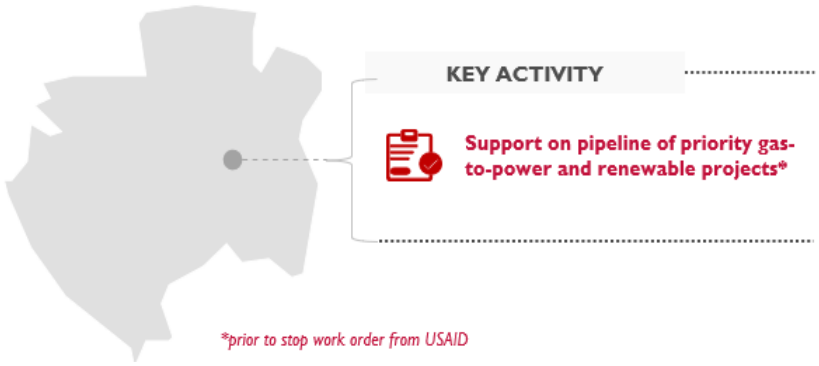
The WAEP team with representatives from SNEL (DRC), ANSER (DRC) and ANER (RoC) during the PEPT training in Kinshasa, July 2023

- Conducting electrical studies using the DIgSILENT software: The WAEP team led a one-week training on "Electrical Studies using the DIgSILENT software" for representatives from the DRC electricity utility SNEL, the Superior Institute of Applied Techniques (ISTA), an institute SNEL works with closely; and from the RoC utility, E2C. This training was requested by SNEL as a priority, as they wished to use modern tools, such as DIgSILENT, to perform calculations and analyses of electricity networks. The training focused primarily on the use of DIgSILENT for electrification planning and through this, SNEL and Energie Electrique du Congo (E2C) will be able to efficiently plan for future networks, or for additions to existing networks in urban or rural areas.
- Design, financing, implementation, and monitoring of universal electricity access programs: The WAEP team also provided capacity building to SNEL as well as other stakeholders (Ministry of Energy, Electrification Agency ANSER) in DRC, and RoC stakeholders (Rural Electrification Agency ANER), on how to carry out the necessary analysis to design, deploy and monitor a universal access to electricity program. The workshop covered modules around financial structuring, gender mainstreaming, good practices and lessons learnt from other electrification programs in Africa. The training was a success as both countries reiterated their wish to see the partnership with WAEP continue during the subsequent steps of their programs, and to see similar capacity building workshops take place again.
- Management of electrification programs: this training was regional and is reported under Section 2.2. of this report "Regional Activities".

Technical assistance provided yielded 12,889 connections from March to June 2023.

> *Through the Electricity Directorate and the National Energy Commission (CNE), the Ministry of Water Resources and Electricity has the honor of thanking USAID and the Power Africa /WAEP for the high-level training session we benefited from on the design, financing, implementation, monitoring and evaluation of Electricity for All Program. The financial modeling learned will help the Ministry and its implementing agencies to design and validate the financial components, particularly the tariff aspects, of electrification projects and programs in accordance with the provisions of the DRC Electricity Act, which privatized all sector activities with the public-private partnership strategy as the keystone."*
>
> ***- The Permanent Secretary of the National Energy Commission of DRC's Ministry of Energy***

2.1.7. GABON

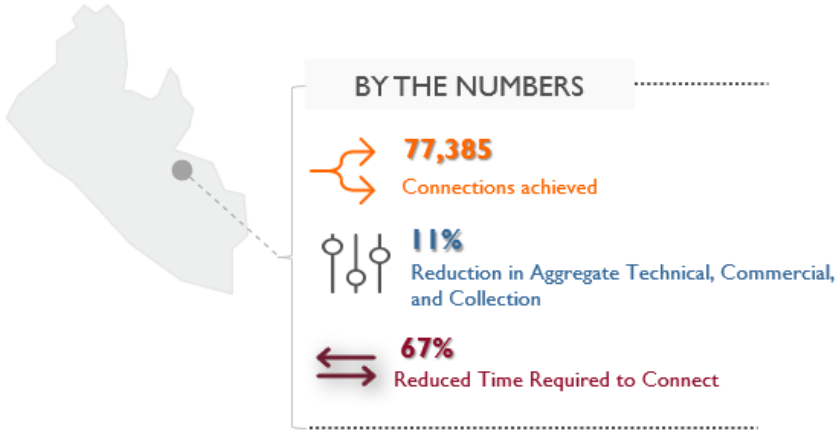


OUTCOME HIGHLIGHTS

Outcome 1

Support to Gabon Power Company to Finance the Energy Transition/Decarbonization: In Year 4, the WAEP team engaged with the Gabon Power Company (GPC) to develop a report/analysis on the financing landscape in energy transition. GPC confirmed that the work conducted by WAEP will help advance the financial close of many energy projects including the 120 MW Owendo expected by Q1 of 2024. In line with this support to GPC, WAEP has also conducted a demand assessment study for the Mayumba project (23MW) which is now finalized. Due to the recent political instability in Gabon, the WAEP team has stopped activity implementation, upon receiving a stop work notice from USAID.

2.1.8. LIBERIA



OUTCOME HIGHLIGHTS

Outcome 2

Supported Reduction of Average Time Required to get a Household Connection and 77,385 New Connections: The WAEP team supported Liberia Electricity Corporation (LEC) on revenue management and distribution concessions to improve utility efficiency and minimize losses. From 2020 to 2023, the average turnaround time for LEC to connect the end-user to the grid dropped from 3 months to 1 month.

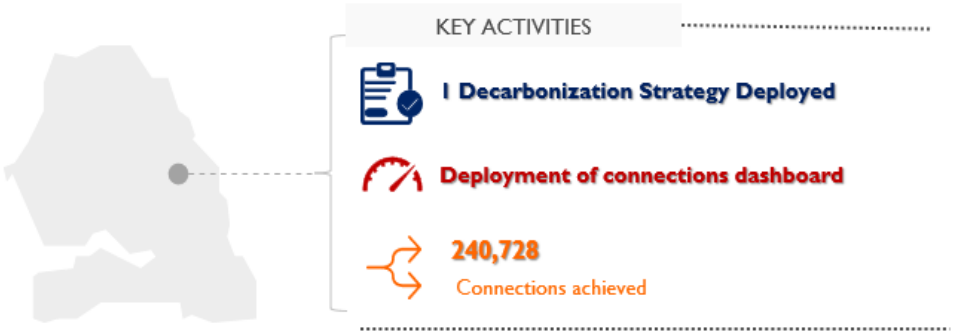
Support provided in Year 3 to LEC in preparing for new connections to the grid and improved grid sustainability and quality of service for existing customers, yielded 77,385 New Connections in Year 4.

Outcome 3

Assistance to Liberia Electricity Company yields an 11.4% Reduction in Aggregate, Technical Commercial and Collection (ATC&C) Electricity Losses: Since Year 2, the WAEP team has delivered targeted technical assistance to ensure that Aggregate Technical, Commercial, and Collection (ATC&C) electricity losses are reduced in Liberia. The WAEP team's efforts consisted of designing a Business Continuity Plan, assessing the engagement with the private sector in utility operations and service delivery in the Nimba, Bong, and Maryland counties, and training utility distribution engineers on network planning. The WAEP team gathered data from LEC to establish that, compared to the baseline year, there has been an 11.4 percent reduction in ATC&C electricity losses due in part to the Program's assistance.

2.1.9. SENEGAL

OUTCOME HIGHLIGHTS



Outcome 1

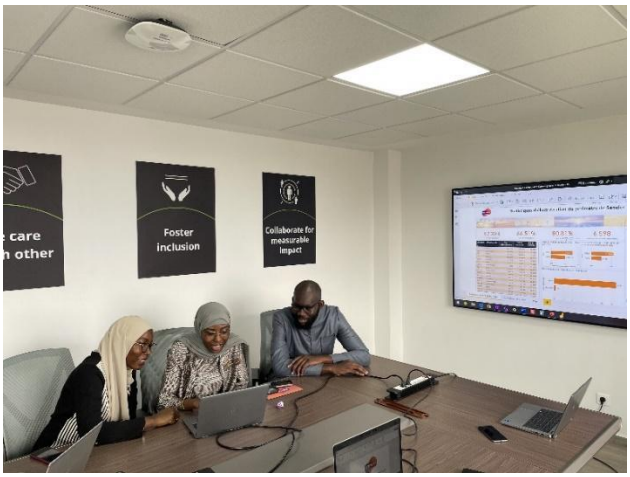
Technical Advisory Services to Senegalese Government on the Decarbonization Strategy: Following the submission and presentation of the Energy Transmission Roadmap to the Ministry of Energy in October 2022, which is the result of an analysis of a set of Gas-to-Power alternatives in-country, the WAEP team continued to seek buy-in on the strategy - presenting to counterparts responsible for the Gas to Power (GtP) projects in Senegal, including key representatives from the Ministry of Petroleum and Energy, Senelec, Domestic Gas Network of Senegal (RGS), the Ministry of Environment and Sustainable Development, and the Ministry of Finance and Budget. In April 2023, the WAEP team prepared a simulation tool to support counterparts in negotiating with G7 countries under the Just Energy Transition. Following the discussions with the SPE, the team is now preparing a next round (phase 2 support) that is very important to help Senegal in energy transition as part of the Just Energy Transition program all in line with the implementation of the recommendations from the WAEP team. The WAEP team plans to present this to the Minister of Energy in early Year 5.

This roadmap provides the essential elements for decision-making on Senegal's Gas-to-Power strategy to determine the most competitive alternative based on the anticipated demand projection of electricity. The next step is to set the conditions that are relevant for the injection of hydrogen and biogas in the gas network, which will be confirmed in Year 5.

Outcome 2

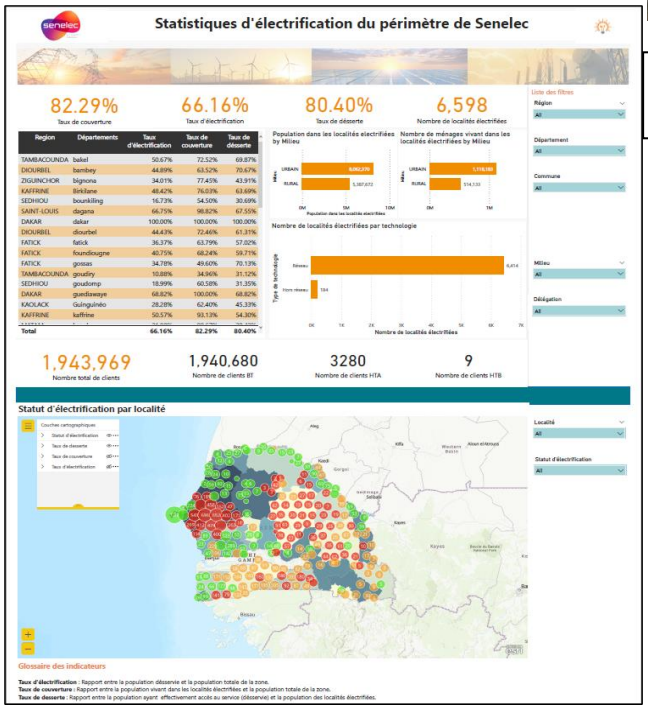
Scaling and Regionalization of Connections Dashboard Tool for Enhanced Connections Tracking in Senegal: The WAEP team continues to support utilities in West Africa to improve digitization of their electrification projects to effectively map and track connections. Replicating the success of the dashboard rollout in Côte d'Ivoire, the WAEP team worked towards developing a similar tool in other countries, including Senegal. In Year 4, the WAEP team worked with Senelec to build a dashboard that will enable the utility to (i) track electrification progress within their country and (ii) monitor the implementation of all the connections under the country's Universal Electricity Access Program. The dashboard includes GIS technology that maps out utility information across Senegal. Once finalized, the WAEP team presented

the dashboard to Senelec's Board of Directors, including Senelec's Chief Executive Officer (CEO), who congratulated the team on the quality of the tool, and expressed his eagerness to have the tool deployed.



Senelec's and WAEP's team at the Deloitte office for the week-long trainings

To ensure sustainability, the WAEP team delivered a week-long training session in Dakar on how to incorporate a database into a PowerBI project; visualization of data using the database; the basics of GIS; how to create a map within Esri's GIS software; how to incorporate the map within the PowerBI dashboard; the importance of data visualizations; and how to fully create a dashboard. With the completion of the dashboard and training, the WAEP team developed and handed over a manual on the use of the dashboard to Senelec, ensuring sustainability of the dashboard and final closeout of the activity.



Support to Senelec to Implement Readyboard Solution to Address Electrification Barriers yields 240,728 new connections: In Year 4, the WAEP team continued providing targeted technical assistance to Senelec to implement a Readyboard solution to address electrification barriers identified with Senelec in Year 3. This will enable Senelec to provide electricity to the most disadvantaged households and advance electricity access as part of the Programme d'Accès Universel à l'Electricité (PAU - Universal Electricity Access Program), which aims to reach universal access by 2025. The Readyboard solution will deploy ready-to-use electrical panels in selected households and develop an electrician training program, to support the implementation of the Readyboard. This activity will facilitate connections in low-income households by simplifying the internal wiring processes and increasing the number of skilled workers available. This year, the WAEP team developed a cost analysis report, which compares the cost of the Readyboard model to the cost of conventional internal wiring. This model was presented at the much-awaited stakeholders roundtable in March 2023. Senelec, the World Bank, COSSUEL and Proquelec

"This dashboard is an excellent showcase for Senelec in the implementation of universal access in Senegal. Thank you for this activity, and we look forward to continuing to work with you on other program activities."

- Ndeye Ami Drame, Head of Transmission Planning Department

participated in this joint workshop on indoor electrical wiring, whose goal was to finalize, in collaboration with the financial and technical partners, the work on the design of the low-cost internal electrical wiring model based on the Readyboard. The workshop allowed the partners to agree on the model of Readyboard to be considered, its components, as well as on all the components of the connection and metering aspects. Preparations for the pilot phase, to validate this Readyboard model as a sustainable option for internal wiring, are underway. Senelec is currently in discussions with the World Bank (WB) to integrate the pilot phase into the pilot phase of the WB-funded Projet d'Amélioration de l'Accès à l'Electricité au Sénégal (PADAES). The team is awaiting feedback from Senelec to begin planning for the pilot phase implementation.

WAEP, Senelec, the World Bank, COSSUEL and Proquelec during the joint workshop on the ReadyBoard, in Dakar

In Year 4, the WAEP team's ongoing support to Senelec on the PAU yielded 240,728 new connections.

2.1.10. SIERRA LEONE

OUTCOME HIGHLIGHTS

Outcome 1

Ongoing Technical Assistance to Baoma Solar PV Project (25MW): The WAEP team is supporting the project sponsors, Serengeti Energy, with the development of a two-phase solar project. The team is assisting the sponsor with identifying and engaging potential grant and concession funding options. The WAEP team expects the Baoma project, Phase 2, to reach financial close by June 10, 2024.

Ongoing Technical Assistance to Betmai Run-of-River Hydro Project (27MW): The WAEP team is supporting the project sponsor, SEWA Energy limited to source investors for the project, conduct a gap analysis on the Environmental Impact Assessment Studies (ESIA) done on the project and help to prepare a bankable project financial model. Under this intervention, WAEP, as partner of the Alliance, successfully supported the onboarding of a US$ 2million grant from GEAPP to assist Project Management and legal facets and an additional US 800,000 grant from USTDA to help close gaps in ESIA process. The WAEP team provided technical advisory to help GEAPP identify opportunities to best leverage carbon financing schemes

The WAEP team in January 2023 updated and further refined the project finance model in preparation for a project development grant application the sponsor is preparing to submit to the Sustainable Energy Fund for Africa. The WAEP team has also facilitated engagement between the sponsor and the US Development Finance Corporation to start the debt capital raising process. The project is expected to reach financial close by December 2024.

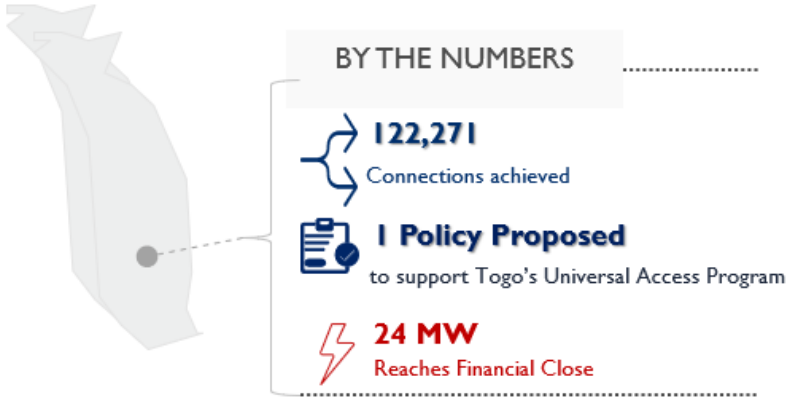
Outcome 2

20,677 New Connections achieved via Utility Performance Support to Electricity Distribution and Supply Authority (EDSA) in Sierra Leone: Through the WAEP team's support to EDSA in utility performance, the Program supported grid expansion of 20,677 new connections in Sierra Leone. The WAEP team supported EDSA in previous years on successful loss reduction efforts, a transition to advanced metering infrastructure (AMI) metering and billing system as well as capacity building on network planning to promote sustainable connections and grid stability.

Outcome 3

Assessing the Impact of WAEP Support on Utility Performance, Loss Reduction and Cost Recovery: In Year 4, the WAEP team conducted a mission to acquire, evaluate and process data for the Program's key performance indicators and to assess the impact of the WAEP team's support to EDSA. The WAEP team received data on key indicators including the System Average Interruption Duration Index (SAIDI), the System Average Interruption Frequency Index (SAIFI), the Customer Average Interruption Duration Index (CAIDI) as well as billing transactions from 2019 to 2022. The WAEP team provided support to Côte D'Ivoire Energies (Côte D'Ivoire), and Societe National D'Electrcté (SNEL) DRC, La Compagnie Energie Electrique du Togo (CEET) to assess existing SAIDI and SAIFI data collection mechanisms and provide technical assistance to enable the targeted utilities to mitigate the frequency and duration of outages. WAEP's assistance included; Assessing existing SAIDI, SAIFI, and MAIFI data collection platforms and providing recommendations for improvement; Providing training on SAIDI, SAIFI, and MAIFI data collection process and complement this with training on how utilities can mitigate the frequency of outages (technical mitigation) including, communication during outages, resource distribution, and recovery system responsiveness.; Providing field training and practical guidelines for network planning and network operations that can help avoid, prepare for, and reduce the likelihood, magnitude, and duration of outages and; Develop a SAIDI and SAIFI data collection, reporting, and mitigation guide and work with targeted utilities to ensure that the guide is adopted. In all, WAEP's assistance has helped Improve the performance in terms of the frequency and duration of outages and the WAEP team is tracking the progress to be able to assess impact.

2.1.11. TOGO



Outcome 1

Technical Advisory to Agence Togolaise d'Electrification Rurale et des Energies (AT2ER) on Solar Projects: Through a Presidential decree on May 11, 2016, AT2ER was created. The agency is a public establishment, endowed with financial autonomy, responsible for implementing the country's rural electrification policy and promoting renewable energies. The WAEP team continued providing capacity building support to AT2ER in improving its processes and evaluation of Renewable Energy (RE) independent power producers (IPPs) under consideration.

- **24 MW Blitta Hybrid Solar PV/BESS Project Reaches Financial Close:** In Year 4, the WAEP team provided support to AT2ER on project finance and financial modeling designed to address specific challenges AT2ER was facing with the Blitta Phase III and Awadjelo project in the final stages of negotiation, upon request of the Director General of AT2ER. The workshop helped to significantly advance the negotiations on both projects. On March 22, 2023, the Blitta Phase 3 project reached financial close and issued the first disbursement/ EPC Contractor notice to proceed with construction. The Phase III expansion project will add 24MW of clean energy and battery storage capacity and expand power access to more than 61,000 households in Togo.

During this period, the WAEP team also developed a Scope of Work (SOW) to provide support to the following projects:

- **25MW + 40MWh Dapaong solar PV project:** Dapaong Solar PV Park is a 30MW solar PV power project in Savane. World Bank is the sponsor and AT2ER, which will be the ultimate beneficiary, will be expected to oversee the construction of the plant and its operation. The EPC selection is expected by March 2024 and the project is expected to enter commercial operation by the end of 2024.
- **42MW Kara solar PV project:** Kara solar is a 42MW solar PV power project in Kara. This project was originally part, along with the 50MW Sokode, of Scaling Solar by IFC which started in Togo in 2019. Ultimately this project was taken over by the Ministry of Mines and Energy, which now owns it 100%, with AT2R as the sponsor. The Togolese authorities went on to secure $41.5M from the West African Development Bank (WADB) in June 2022 to finance the entirety of the project. AT2ER has leveraged the documentation put together when the project was part of Scaling Solar to progress the rest of the development and will launch an RFP for the selection of an EPC in the coming months.
- **50MW Sokode Scaling Solar project:** The Government of Togo has launched a call for request for proposals (RFP) from shortlisted bidders for a 50 MW grid-connected solar PV tender, launched in December 2019 under the World Bank Group's Scaling Solar program. The project is to be located

near Sokode in the Central Region of Togo. Meridian/EDF is negotiating to be the sponsor. The Financial Close is expected by December 2023.

As of the end of Year 4, this work is currently on hold as the Program is awaiting communication from A2TR on the appointment of a new CEO.

Outcome 2

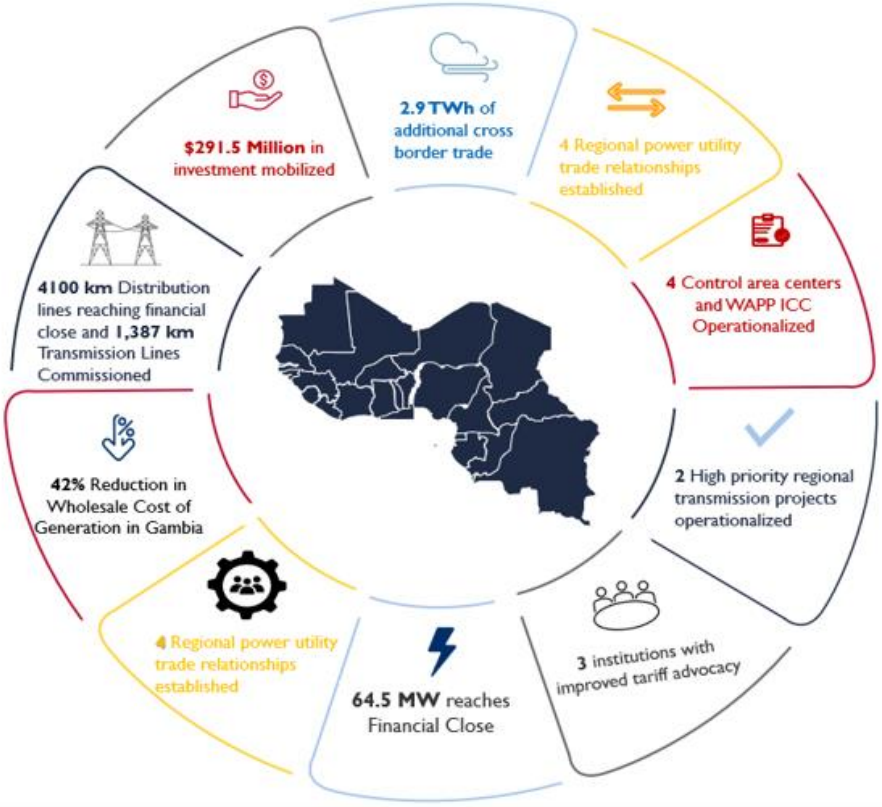
Technical Assistance to the Ministry of Energy and CEET yields 96,248 Connections: In Year 4, the WAEP team concluded its support to Togo's MOE in the establishment of the 'Fonds Tinga' initiative – a revolving fund to support Togo's Universal Access Program. The WAEP team assisted the MoE to update the financial model of Fonds Tinga and provided guidance on the key documents to prepare to make a strong case for funding from development partners and financial institutions. The WAEP team also gave high-level feedback on the universal electricity access pilot phase and recommendations on recruiting a Fund Manager for Fonds Tinga.

The WAEP team then pivoted to provide technical assistance to the utility CEET, on active electrification projects in Togo in order to roll out connections – supporting the development of a dashboard to monitor electrification projects, and training on electrification project management. Working with CEET, the teams began the process for building CEET an electrification database and dashboard. To start, the teams identified the purpose of the dashboard, began identifying the data needed for the dashboard, and mapped the indicators that will be shown on the dashboard. During this process, CEET and WAEP identified that CEET would benefit from a data collection tool to feed new data into the database and dashboard. CEET and WAEP held a demonstration on a data collection tool that CEET will continue to utilize. This new digital data collection framework will make the registration of new customers on the ground faster, easier and more reliable. The teams are finalizing the database storage solution and will continue to build out and finish the dashboard.

The WAEP team's technical assistance to Togo's MoE in the operationalization of the electricity access fund, Fonds Tinga, and support to the utility CEET on more efficient roll-out of connections, yielded 60,554 new connections in Togo during the reporting period.

2.2. REGIONAL ACTIVITIES

In Year 4, the WAEP team continued to engage closely with counterparts in many of its focus countries to enhance electrification activities, provide on the ground advisory services, improve institutional structure and capacity, and create the enabling environment for donor coordination and gender inclusiveness. The Program's efforts since inception, has contributed to the operationalization of four control area centers as well as the WAPP ICC. Over the past year, the WAEP team continued to extend its reach throughout the region, including to G5 Sahel member countries and a few Central African countries.



2.2.1. Advancing the Desert to Power Initiative With AFDB

OUTCOME HIGHLIGHTS

African Development Bank (AfDB) DtP Collaboration: Through the Program's Advisor to the AfDB, the WAEP team supported DtP in mobilizing $188 million for two flagship projects in Niger and Chad. The two projects will enable the construction of an additional 40.5 MWp of solar capacity, 156,864 new connections and/or improved connections, and 2,759 kilometers of distribution line. The WAEP team has also teamed up with the International Renewable Energy Agency (IRENA) and the Islamic Development Bank to provide tailored technical assistance and hands-on capacity building to the DtP countries.

Outcome 1

***Technical Support to the $21 million P*roject d'Appui au Secteur de l'Energie électricité au Tchad (PASET) to facilitate 45,000 connections and 72 kms*:** The WAEP team participated in the AfDB evaluation mission for the design of the PASET project. The PASET is a $21million facility, financed

by the AfDB, the Green Climate Fund resources from the DtP Financing Facility, the WAEP team and the Government of Chad. The project aims to (i) regularize 45,000 connections from the installation of the equivalent number of meters as well as (ii) reduce technical and non-technical losses. The WAEP team committed to deliver five regional trainings to the G5 Sahel countries including a project management training to be delivered to the project management unit within the Chadian utility company, Societe Nationale d'Electricite (SNE).

Support to $167 Million RANA Project to facilitate 40.5MW, 2,687 KMs and 111,864 connections: In Quarter 3 of FY 23, the AfDB team cleared the documentation related to the condition's precedent, allowing the first disbursement of funds for RANA. This means that the AfDB funded component of the $167 million RANA project, co-financed by Power Africa, has reached financial close. Thus the following component of the RANA project has also reached financial close: (1) construction of solar PV plant at Maradi (20 MWp); (2) hybridization of the power plant in Diffa (10 MWp); (3) construction of an off-grid solar PV mini power plant (488 kWp) with storage; (4) construction of 1,203 km of HV distribution network; (5) construction of 1,484 km of LV distribution network; and (6) construction of a mini-grids cluster distribution system to supply 12 rural localities (15 km MV, 30 km LV, 12 H61 substations).

The OPEC Fund for International Development (OFID) concluded the mission evaluation of the solar power plant, Dosso (10 MWp). The Dosso solar power plant is entirely financed by the OFID as part of their co-financing of the RANA project. The financing agreement related to the Dosso solar power plant has been signed and ratified by the Government of Niger, allowing for the RANA project to reach financial close.

Collaboration with IRENA on Building Capacity of Energy Stakeholders to Integrate Renewable Energy into their Electricity Grid: The WAEP team, in collaboration with IRENA continued to provide capacity building for G5 Sahel countries to understand the challenges and solutions to integrating variable renewable energy (vRE) into their electricity grid. This session included over 51 (of which 19% was female) participants from the developers, utilities and energy ministries of Chad, Niger, Mauritania, and Burkina Faso.

The WAEP team also supported the AfDB to organize a side event during the 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27), under the theme *'Desert to Power– transforming the Sahel from fragility to resilience and prosperity'*. It brought together government ministers, development partners and private sector representatives to discuss how to facilitate private sector investments in the Sahel. It offered the right platform to present the DtP to potential partners and to rally investors toward its implementation.

Outcome 2

Capacity Building Collaboration with Islamic Development Bank for G5 Sahel Countries: The WAEP team's support to RANA and PASET is comprised of several activities, including: (i) the creation

of a dashboard for the Niger utility, Nigelec, (ii) capacity building on the management of electrification projects and (iii) a workshop on network optimization.

Prior to the Coup d'état in Niger, leading to a pause in direct work with Nigelec, the WAEP team had begun the development of a dashboard to manage electrification efforts.

Participants during the Acceleration of Electrification Projects Training for the G5 Sahel Region

Photo credit: Power Africa

The WAEP team, in a dynamic collaboration with the co-financing partner, Islamic Development Bank (IsDB), developed and delivered a pivotal five-day workshop for G5 Sahel countries. This initiative aimed to enhance electrification project management, expediting grid expansion and improving electricity access, as well as support the financial sustainability of AfDB's Desert to Power initiative. This event titled "Accelerating Electrification Projects in G5 Sahel Countries" equipped key staff from G5 Sahel utilities with essential skills in planning, financing, constructing, and maintaining reliable networks, with a focus on efficient metering systems. Notably, Ivorian utilities CIE and CI-Energies shared valuable insights, fostering enthusiasm for collaboration in the Sahel region. This workshop exemplifies effective knowledge-sharing and collaboration, a driving force advancing electrification projects and partnerships in the Sahel region.

2,759 km of distribution lines reach financial close with support to AfDB's Through ongoing technical assistance provided to the RANA and PASET projects, the WAEP team recorded a total of 2,759km (RANA: 2,687km and PASET: 72km) of distribution lines reaching financial close.

1,341 km of distribution lines reach financial close with support to AfDB's Electrification and Power Connection Development Project (PEDECEL): In previous program years, the WAEP team reviewed the AfDB's Project Appraisal Report (PAR) and provided GIS capacity building support to Burkina Faso utility, Société Nationale d'électricité du Burkina Faso (SONABEL) in utilizing the ArcGIS software. This capacity building effort supports SONABEL to map and track new connections related to PEDECEL. This contribution represents an example of in-kind support included under PEDECEL that helped 1,340.98km of distribution lines reach financial close.

2.2.2. SUPPORTING THE ACCELERATION OF THE REGIONAL ENERGY MARKET

OUTCOME HIGHLIGHTS

Outcome 1

Outcome 4

WAEP Grid Code Assistance to the OMVG Leads to the Operationalization and Energizing of Interconnections between 4 Countries: The WAEP team has been supporting OMVG with the requisite technical assistance to fully operationalize and energize interconnections between Senegal, Gambia, Guinea, and Guinea Bissau. As a result of the WAEP team's technical assistance in grid code setting, OMVG has commissioned additional line segments:

- Tambacounda to Kedougou transmission in Senegal: 252 km
- Kaleta-Linsan-Labe-Mali transmission line i: 567 km

Through ongoing technical assistance, including support in aligning the OMVG Grid Code with the WAPP Regional Grid Code, the Program facilitated the strengthening of regional power utility trade relationships between the utility, EDG and utilities in four other OMVG member countries – Guinea, Guinea-Bissau, Senegal, and Gambia.

Additionally, in Year 4, the WAEP team recorded the reduction in wholesale cost of generation by 42 percent in Gambia, from a baseline of USD 0.26/kwh, under the PPA signed between Senegal and Gambia.

Support to Senegal River Basin Development Organization (OMVS) leads to the Commissioning of a 284km double circuit 225 kV Transmission Line and Increased Power Trade in 3 Countries: With support to OMVS, the 284 km double circuit 225 kV transmission line between Kayes and Tambacounda was commissioned in October 2022. The commissioning of this line will contribute to increasing power trade between Mali, Mauritania, Senegal and beyond given that with this line, the OMVS and OMVG networks are now connected at Tambacounda substation. WAEP support included Monitoring & Evaluation, GIS training, Project management training, and WAEP - WAPP Exchange forum on Environmental and Social safeguards.

With this line, the capacity and reliability of the transmission system for Mali, Mauritania and Senegal are reinforced. This will result in increased energy trade and grid stability in the sub region. With this, the Program recorded the operationalization of the OMVS Transmission Expansion Project.

2.2.3. Strengthening Institutional Capacity Across the Region

OUTCOME HIGHLIGHTS

Outcome 2

Capacity Building for Project Management Units (PMUs) in West and Central Africa: In Year 4, the WAEP team continued to expand its reach across the region, developing and leading a workshop on enhancing electricity access to Project Implementation Units (PIUs) from 10 regional utilities across West/Central Africa (Cameroon, Togo, Democratic Republic of Congo, Republic of Congo, G5 Sahel countries). The primary objective of this workshop was to enhance the participants' capacity to efficiently oversee the electrification projects and included topics such as project definition, monitoring and management, understanding organizational impacts on projects, cost control strategies, stakeholder engagement, and understanding the human dynamics of change. Throughout the training, practicality was emphasized through the integration of real-world case studies, enhancing the overall learning experience.

The workshop's impact was notable. In post-training evaluations, an impressive 90% of participants who completed the questionnaires expressed satisfaction with the program, highlighting its relevance. This achievement reflects the WAEP team's commitment to advancing electrification and sustainable development in the region by equipping professionals with essential skills to contribute effectively to electricity access projects.

Outcome 3

Capacity Building and Technical Assistance to improve System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) Performance: In Year 4, the WAEP team began delivery on a regional activity that seeks to improve System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) performance in Côte

"Without exception, all four of the modules covered in this training course provided me with a real foundation for capacity building and skills in electrification project management."

- Evariste Abira, Energie Electrique du Congo (E2C), Republic of Congo.

d'Ivoire, Togo, and DRC. Throughout the year, the WAEP team collected data, from utilities, namely, SNEL (DRC), CEET (Togo) and CI-Energies to define the current SAIDI, SAIFI performance practices and assess the capacity of their distribution networks.

The WAEP team prepared a practical guide on calculating SAIFI and SAIDI values for technical managers and maintenance personnel, explaining the methods for collecting or estimating interruption characteristics, analyzing the results, and the corrective actions of reducing indicators. The WAEP team expects that the counterparts will adopt this guide as a practical tool for network planning and operations that can help avoid, prepare for, and reduce the likelihood, magnitude, and duration of outages.

The WAEP team with energy sector representatives from Gabon, CAR, the Republic of Congo, and Cameroon during a capacity building session on Tariff Setting for Small-scale Power Generation

Support to regulatory agencies in Central African countries on tariff setting and financial modeling: To build capacity on the design of tariff methodologies and financial models for energy projects in the Central African context, this year, the WAEP team led a series of training sessions and provided technical assistance to electricity sector regulators from Cameroon, Chad, Gabon, Congo, and the Central African Republic. This support enhanced stakeholders' ability to draft and negotiate PPAs and other standard contracts in the electricity sector.

The team also delivered sessions that focused on off-grid renewable energy projects to build financial modeling capacity among regulators, utilities, and IPP mini-grid developers, and support their ability to work with investors to communicate and mitigate sector risks to accelerate capital inflows to the West Africa off-grid clean energy sector. Representatives from Cameroon and Gabon participated in-person, while those from Congo, Central African Republic, and Chad attended the training remotely.

WAEP anticipates that with the capacity building support provided, stakeholders will be able to develop additional cost-reflective tariff capacity and acquire new skills to address the need for countries to develop, advocate for, and enact cost-reflective tariffs and policies to enhance energy sector governance.

Outcome 4

WAEP and WAPP teams at the WAPP Secretariat in Cotonou

Support to the West African Power Pool WAPP ICC on the Operationalization of the Regional Electricity Market: In Year 4, the WAEP team received a letter of appreciation from the WAPP Secretary General recognizing WAEP's support for the operationalization of the regional electricity market, including operationalization of WAPP ICC and four control area centers. WAEP's assistance to WAPP contributed to the (i) interconnection of the 14 mainland ECOWAS countries and facilitated increased regional electricity trade and (ii) the successful permanent synchronization of two zones involving 12 countries. The WAPP Secretary General also validated the Y4 program activities following discussions on the WAEP technical assistance conducted over the past three years. The approved program includes (i) support in reviewing VRE trainings already delivered to determine potential gaps, (ii) support re-run of security assessment studies and deliver training, (iii) provision of training on the basic principles of the planning software PLEXOS, (iv) development of data update framework, (v) delivery of training on GIS for WAPP Project Management Units (PMUs), and (vi) develop a Project Implementation Manual for WAPP PMUs. Based on preliminary discussions with relevant subcontractors and consultants, the WAEP team drafted terms of reference for the re-run of security assessment studies and training,

Implementation of an Ancillary Services (A/S) Procurement Roadmap for WAPP: In Year 4, the WAEP team in collaboration with WAPP ICC, provided key capacity building support on the ancillary services procurement roadmap and presented in detail the country-by-country ancillary services guidelines. This roadmap is a guiding document that will facilitate the implementation of ancillary services market within the WAPP which will help maintain the reliability of the WAPP interconnected system. Implementation of effective ancillary services on the regional network is a key requirement for effective function of the market. In the same vein, the WAEP team also supported WAPP ICC to gather accurate Supervisory Control and Data Acquisition (SCADA)/Environmental Management System (EMS) data and helped facilitate data exchange between WAPP ICC and the transmission system operators (TSO). The WAEP team's increased support to WAPP contributes to its goal of strengthening the regional electricity market.

Collaboration with WAPP ICC on a System Wide Studies Workshop: In Year 4, the WAEP team, in collaboration with WAPP/ICC organized a WAPP Stakeholder Engagement workshop to review and validate the System Wide Studies developed for WAPP. The workshop took place in Accra with the participation of 17 WAPP representatives. The teams reviewed the methodology developed by the WAEP team which will be instrumental in further reinforcing capacity in certification of system operators to improve their ability to conduct system-wide adequacy and reliability studies-Generation Adequacy Studies, Transmission Adequacy Studies, Security Assessment, Regional Grid Flexibility Assessment, Optimal Power Flow (OPF) and Reactive Power Planning Studies, Assessment of WAPP ICC skills for

system-wide studies, System-wide study procedures. Following this meeting and subsequent discussions between the WAEP team and WAPP/ICC, both teams have agreed to separate the System Wide Studies report from the training activity.

2.99 TWh of Cross Border Energy Exchanges realized via Support to OMVG and OMVS: In Year 4, the WAEP team collected data on energy exchanges the Program helped to facilitate through ongoing support to key stakeholders in the region. The WAEP team provided key support to the regional entities on project management, GIS and monitoring and evaluation and alignment of the OMVG Grid Code with the WAPP Regional Grid Code and Optical Ground Wire (OPGW) Operating Agreement. With increased cross-border energy exchanges, electricity accessibility and affordability are enhanced for the populations of these countries involved. This year, the WAEP team reported:

- Increased energy exchanges within the OMVG network between Senelec (Senegal) and NAWEC (The Gambia): a total of_0.264TWh
- Increased energy exchange within the OMVS network, between SOGEM, Senelec and SOMELEC (Mauritania) grids: a total of 2.386 TWh
- Increased energy exchange within the TransCo CLSG network between Côte d'Ivoire and Liberia, Sierra Leone, and Guinea: 0.348 TWh

Support to ECOWAS Regional Electricity Regulatory Authority (ERERA) on Market Monitoring Trainings: In Year 4, the WAEP team developed a SOW relating to the third ERERA training session on market monitoring. In fact, according to ERERA needs, this third session should focus on the development of a proven market surveillance tool which will allow ERERA to fully play its role as regulator of the regional electricity market. It will include business processes, indicators, and mechanisms to (i) mitigate market power, (ii) provide transparency and prevent market abuse in the regional electricity market. Validation meetings are planned with ERERA to launch the activity.

3. LESSONS LEARNED AND LEAD SCALABLE PRACTICES

3.1. LESSONS LEARNED

This section highlights some key lessons the WAEP team learned during its program delivery at both regional and national levels in Year 4.

- **Maintain Synergy Between DFI Partnerships:** WAEP and the AfDB's close collaboration on implementing the DtP program has proved highly fruitful in financing investment in the region. AfDB recognizes the value of WAEP's assistance to the extent that Power Africa is now recognized as one of the project's financiers.
- **Conduct a Regional Approach to Certain Aspects of Technical Assistance:** WAEP has provided several capacity building exercises on diverse topics on a regional basis with remote and in person attendance. The feedback from utilities, ministries, regulators and rural electrification agencies on these sessions has been extremely positive, illustrating its success.

3.2. LEAD SCALABLE PRACTICES

- **Accelerating the energy transition in West Africa.** The Program will continue to focus on delivering transaction advisory support and capacity building for governments in the region with a key emphasis on encouraging the transition to renewable energy. WAEP will also build upon the success of regional initiatives such as the AfDB Desert to Power program which is working to expand the growth of clean energy generation across the G-5 Sahel. The Program will continue its collaboration with Power Africa Development Partners to increase access to new financing and credit enhancement instruments for both developers and governments.
- **Scaling electrification support at the regional level through collaboration with DtP and ECOWAS.** The WAEP team will continue to support electrification initiatives across the region to advance connections. The teams will achieve this by replicating successful approaches and interventions across regional platforms, including Desert to Power's regional electrification projects.
- **Furthering collaboration with Power Africa Development Partners and Development Finance Institution to maximize impact.** The WAEP team is building partnerships with Power Africa Development Partners and DFIs such as the AfDB Desert to Power Initiative and the Islamic Development Bank, to open up additional opportunities for the team to leverage resources in order to achieve and even exceed targets.
- **Leveraging Battery Energy Storage System (BESS) Technology.** After the success of Djermaya, the team will seek to provide much needed knowledge transfer on the functionality and optimal utilization of BESS technology to enable sustainable integration of renewable energy into grids in West Africa thereby facilitating fast track scale up of access to clean energy.
- **Enabling development of a fully functional West African power market.** Following the successful synchronization of the West African regional power grid, previously supported by WAEP, the team will work with the Regional Regulator, ERERA, to better understand how to monitor a functional power market and to define the required monitoring tools. This assistance is a prerequisite for implementing the soon to be implemented day ahead mechanism in the market.
- **Scaling support to off grid initiatives in the region**. Building on the successes of the recently closed Power Africa Off Grid Program (PAOP), WAEP will leverage the knowledge of selected former PAOP advisors as well as the current team to continue advising the private sector and governments on upscaling deployment of Solar Home Systems (SHS), Mini-grids and Productive Use of Energy (PUE) initiatives. In addition, WAEP will work with country regulators to build off grid regulatory capacity and provide regional webinars on key topics related to off grid development.

4. PROGRAM MANAGEMENT OFFICE, FINANCE, AND OPERATIONS

4.1. PROGRAM MANAGEMENT OFFICE

The WAEP team's centralized Program Management Office (PMO) continued to coordinate cross-cutting functions, including communications, environmental mitigation and monitoring, monitoring, evaluation, and learning (MEL) and gender mainstreaming, ensuring the integration of all these functions into project activities. The PMO team worked to streamline the development of contractual and technical deliverables, as well as external communications, to maximize efficiency, ensure quality assurance and communicate

the Program's impact. To strengthen data collection, reporting and storytelling, the PMO team worked closely with Outcome teams to review activities and translate results into impacts.

The following sections provide an overview of major cross-cutting activities.

4.1.1. Gender Strategy and Integration Key Activities

In Year 4, through technical support and capacity building activities, the Program supported the transition of three additional women into leadership roles in the energy sector. To encourage girls to pursue careers in the STEM field, WAEP also hosted a series of webinars for young women in schools across the region, including Ghana, highlighting the experiences of women in STEM fields.

West African Girls in Science Technology Engineering and Mathematics (STEM) Webinar: The WAEP team hosted 82 students from Peak Lyceum, African Science Academy, and Light Academy on February 28, 2023 for the West African Girls in STEM Webinar. Eunice Biritwum, WAEP Outcome 1 Lead moderated the webinar session. The webinar also featured five female panelists who work and study in the STEM sector. The panelist - Sherron Brisbane Sherman: Senior Manager, Liberia Electricity Corporation; Mariama Kamara: Founder/Director, Smiling Through Light, Sierra Leone; Aminata Cisse, Energy Engineer, West Africa Energy Program, Senegal; Belinda Carl, student, Ghana and Leticia W. Appleton, student, Liberia, responded to questions about why they study STEM, advice for having a career in STEM, and questions from the students.

Students, panelists and USAID Energy Specialist during the STEM webinar

WAEP receives International Rescue Committee (IRC) PRO-JEUNES Award: The IRC presented an award to the WAEP Country Manager in Côte d'Ivoire, recognizing the Program's support to the Pro-Jeunes project which aims to work with 10,000 youth to provide business skills through a tech-forward, hybrid learning approach. In this capacity, the Pro-Jeunes Vocational Training for Women in Energy Program was established to build a pipeline of over 350 women to enter the solar industry in Côte D'Ivoire. The WAEP team provided in-person technical classes and webinars to students, along with mentoring sessions for young female learners, the Program matched with female mentors in the energy sector. The team also conducted a feasibility study that is supporting the construction of 25 kW Solar Power Plant.


Second from left WAEP Côte d'Ivoire Country Manager holding the IRC Award

Togo Ministry of Energy Public Procurement in Energy Training: The Gender team partnered with the Tony Blair Institute (TBI), GIZ, and the National Directorate for Public Procurement Control (DNCMP) in Togo to coordinate materials, agendas, communications, and lead training sessions for the

Togo Ministry of Energy (MoE). The WAEP team conducted the training on April 4 and 5, 2023 at the IOKA hotel in Lome, with 23 female participants from the Togo MoE. By completing the training, the participants have gained an understanding of the public procurement and donor procurement chain, techniques and methods for evaluation, and contract award procedures. The WAEP team will continue to reach out to participants throughout the life of the Program to assess their career progression.

WAEP team during a training with representatives from Togo's Ministry of Energy. Photo credit: Power Africa

Development of Science, Technology, Engineering and Mathematics (STEM) Workbook: The WAEP team developed a STEM Workbook for students to learn more about the various careers in STEM, why STEM is important, and provides activities to learn more about STEM. This was distributed through Power Africa channels in English and French.

Women Energy Champions (WEC) Series: The WEC series is meant to highlight women in the energy sector who are doing amazing work in the sector and demonstrate mentorship qualities. The WAEP team continues to identify and interview WEC candidates for features. Over Y4, the WAEP team featured the following stories:

- Aminata Cissé, Regional Electricity Access/CLIN 1 OC 2 Lead, WAEP, Read about her journey: LinkedIn, Facebook and Twitter.
- Linda Clarke, Commercial Manager, Shell Energy Ghana, Read about her journey: LinkedIn, Facebook, Instagram and Twitter.
- Sherron Brisbane Sherman, Senior Manager, Liberia Electricity Corporation (LEC). Read about her journey: Facebook , Twitter and Medium.

WEC Facebook post of Aminata Cisse, Regional Electricity Access Lead

Energy Sector Women Leadership Initiative (ESWLI): In Year 4, the Gender team prepared for the first ESWLI cohort within the francophone region. Energy Sector Women Leadership Initiative (ESWLI) Cohort held in Abidjan: The fourth ESWLI cohort was held in Abidjan from October 18 - 19, 2023, with remote participation. Fourteen women attended in person, with an additional 28 joining virtually from seven Francophone countries. ESWLI's tailored program equips women in the energy sector with vital management and leadership skills. The successful two-day training covered diverse modules, from "Leading with Emotional Intelligence" to "Being Politically Savvy".

Previous participants of ESWLI cohorts continually report the positive impact these trainings have had on their careers. Margaret Yainkain Mansaray, who leads Women in Energy in Sierra Leone, shared that participating in the ESWLI cohort gave her the knowledge and skills necessary to contribute effectively to her organization's gender-related initiatives. As a result, she has been able to reach more women in

the market and has a 50% gender balance on her team. She also reported that the workshop's focus on developing relationships led to improved collaboration with her colleagues which resulted in improved teamwork and project outcomes. Overall, she acknowledged the ESWLI program's contribution towards significantly improving her professional growth. In addition to this, two participants from the 2nd cohort have reportedly advanced their roles within LEC. One being promoted from Health and Safety Assistant to Environmental, Health and Safety Officer, and another employee now leading gender work at LEC.

4.1.2. Communications and Outreach

Social Media Roundup

Lighting up Liberia: Power Africa published a blog showcasing WAEP's support to the Liberia Electricity Corporation in implementing an innovative power delivery model that is bringing light to communities. This assistance involves the construction of 77 km of 33-kv distribution power lines to Gbarnga in Bong County and facilitating a public-private partnership with Jungle Energy Power to operate and manage the Bong County grid. The blog is available on Power Africa's: , Twitter and Facebook.

Fostering Regional Power Collaboration: Blog showcasing the Program's assistance to the utilities of Senegal and The Gambia under OMVG to advance electricity trading. Blog is available on LinkedIn, X (formerly Twitter) and Medium.

Renewable Energy Training: Social media post highlighting a collaborative training conducted in partnership with AfDB and IRENA for G5 Sahel countries. The training aimed to enhance governments' understanding of addressing the challenges and solutions for integrating variable renewable energy such as wind and solar into their power grids. The post can be found X.

Twitter post on OMVG blog

Reduction of Wholesale Cost of Generation in Gambia: Power Africa published content on the Program's support to the Gambia's National Water and Electricity Company in its connection to the Gambia River Basin Development Organization (OMVG) regional power market, ultimately reducing the cost of generation in Gambia by more than 40 percent. The post was published on Power Africa's LinkedIn, Facebook, and Twitter.

Reducing the Cost to Connect in Togo: Power Africa posted a success story highlighting the Program's support to Togo's Ministry of Energy in launching *Fonds Tinga,* a fund dedicated to lowering upfront connection costs, ultimately increasing access to the grid.

The blog can be accessed via LinkedIn, Facebook, Medium, and Twitter.

Blog on Assistance to the TRANSCO CLSG: Power Africa published a story highlighting our support to Côte d'Ivoire, Liberia, Sierra Leone, and Guinea Interconnection project bringing electricity for over 20 million people. The story is available on LinkedIn, Facebook and Twitter.

Mission to Cabo Verde: Highlights of the WAEP team's visit to Cabo Verde, which include training ELECTRA staff on reducing energy losses and recovering customer debt, engaging with key stakeholders, and meeting U.S. Ambassador to Cabo Verde, Jeff Daigle. The post is published on Facebook and Twitter.

Senegal's Energy Transition Strategy: Power Africa highlighted the Program's support to Senegal's Ministry of Energy to develop and implement its energy transition strategy. This strategy will assist Senegal with its efforts to reach universal access to electricity by 2025 and reduce GHG emissions by 30 percent by 2030. The post was published on Power Africa's LinkedIn, Facebook and Twitter. This post recorded the most engagements on LinkedIn, Facebook and Twitter during the week of December 5-9, 2022.

Participation in Storytelling and Multimedia Bootcamp for Implementing Partners: The WAEP Communications Specialists participated in a two-day training session on storytelling and multimedia bootcamp for implementing partners organized by the USAID West Africa Regional Economic Growth Office. USAID Development Outreach Communications Specialists facilitated the training to enhance capacities in impact storytelling, video editing, communication best practices and understanding Embassy protocol processes. The sessions were insightful and provided useful perspectives for storytelling, video capturing using smartphone devices, video editing, USAID Branding specifications, project event guidelines for participation of US Embassy Officials and opportunities to enhance project visibility. These will be incorporated into the Program's day-to-day work and where necessary, extended to technical teams.

4.1.3. Environmental Mitigation and Monitoring

In Year 4, the CLIN 1 Environmental advisor continued to monitor transaction performance in line with WAEP's Environmental Mitigation and Monitoring Plan (EMMP). In accordance with the EMMP, environmental and social screening of WAEP supported transactions is required against the Preliminary Environmental and Social Review Methodology (PESRM) Checklist. During the reporting period, the WAEP team completed and submitted 4 PESRMs to USAID, including Ngouandere Solar, Yeleen Solar, Kong Solar and Solar Era.

4.1.4. Monitoring, Evaluation, and Learning (MEL)

Quarterly Power Africa Information System (PAIS) Data Entry: The MEL team uploaded the CLIN 1 and CLIN 2 Quarterly results and supporting documentation in the PAIS system for Power Africa review.

USAID ASSESS Virtual Workshop on MEL: The MEL team took part in a two-day virtual capacity building workshop that focused on understanding basic USAID MEL terms, MEL requirement for implementing entities, developing an activity MEL plan, understanding, planning and implementing and Monitoring and Evaluation system as well as conducting a data quality assessment.

FY2022 Development Information Solution (DIS) Reporting: The MEL team updated the DIS portal with the disaggregate results for FY22 and provided a deviation narrative for indicator results that were +/- 10% of the target.

FY2022 USAID Data Quality Assessment (DQA): The MEL team took part in a DQA with USAID.

MEL Plan Update: The MEL team is in the process of updating the MEL plan for both CLINs to reflect results achieved to date, updated targets and revision of two indicator definitions.

4.2. FINANCE AND OPERATIONS

PROGRAM STAFFING

During FY23, the WAEP team continued a hybrid working mode, with staff working from the office on a rotating basis. The WAEP team continued to use its project office to host in-person meetings and training for stakeholders when virtual formats are not suitable.

Subcontracting: In Year 4, the WAEP team renewed its existing contractual relationships with Deloitte Côte d'Ivoire, Deloitte Ghana, Crossboundary and Enernex to reflect the extension of WAEP Period of Performance through July 2024, with the goal to provide technical assistance in delivery of the Program.

Table1: Staffing Changes

Name	Role	Location	Date
Christopher Bawumia	Contracted as Finance Specialist	Accra, Ghana	October 2022
Krystal Chindori-Chininga	Contracted as Management Advisor	Accra, Ghana	January 2023
Abigail Apraku Bondzie	Resigned as Communications Specialist	Accra, Ghana	February 2023
Ewurama Greenslade	Contracted as Communications Specialist	Accra, Ghana	March 2023
Aminata Cissé	Assigned as Senegal Country Manager and OC2 Lead	Dakar, Senegal	March 2023
Abdou Mbaye	Resigned as Senegal Country Manager and OC2 Lead	Dakar, Senegal	March 2023
Amadou Bassirou	Assigned as Regional Power Markets Lead (OC 4 Lead)	Guinea	March 2023
Ibrahima Thiam	Resigned as Regional Power Markets Lead (OC 4 Lead)	Dakar, Senegal	March 2023
Michelle Tsagli	Resigned as MEL Specialist	Accra, Ghana	May 2023
Sharon Parku	Contracted as MEL Specialist	Accra, Ghana	June 2023
Erika Sherr	Resigned as Engagement Coordinator	USA	June 2023
Emma Behr	Contracted as Engagement Coordinator	USA	June 2023
Brian Baltimore	Resigned as Senior Transactions Advisor	Accra, Ghana	July 2023
Guillaume Charon	Transitioned to the role of Senior Transactions Advisor	Remote	July 2023
Christopher Bawumia	Resigned as Finance Specialist	Accra, Ghana	July 2023
Nicholas Kunyanga	Contracted as Finance Specialist	Accra, Ghana	September 2023

Edith Mills Tay	Resigned as Office Manager	Accra, Ghana	September 2023
Ewurama Greenslade	Resigned as Communications Specialist	Accra, Ghana	September 2023

Table 2: STTA Recruited in this Reporting Period

Name	Role	Location	Date
Jamal Carnette	Contracted as Short-Term Transaction Advisor	Remote	December 2022
Augustin Kazakevicius	Contracted as Short-Term Transaction Advisor	Remote	December 2022
Elise Green	Contracted as Short-Term Transaction Advisor	Remote	December 2022
Katherine Fobben	Contracted as Short-Term Transaction Advisor	Remote	December 2022
Milani Chatterji-Len	Contracted as STTA for Regionalization of Dashboard and GIS Efforts	Remote	January 2023
Ndèye Maty Tall	Contracted as CLIN 1 OC2 STTA	Dakar	March 2023
Tea Mihic	Contracted as Distribution Advisor	South Africa	May 2023

4. RISKS, CHALLENGES, AND MITIGATION MEASURES

This section of the report presents potential risks and challenges identified during this reporting period and WAEP's plans to mitigate the risks or address the challenges.

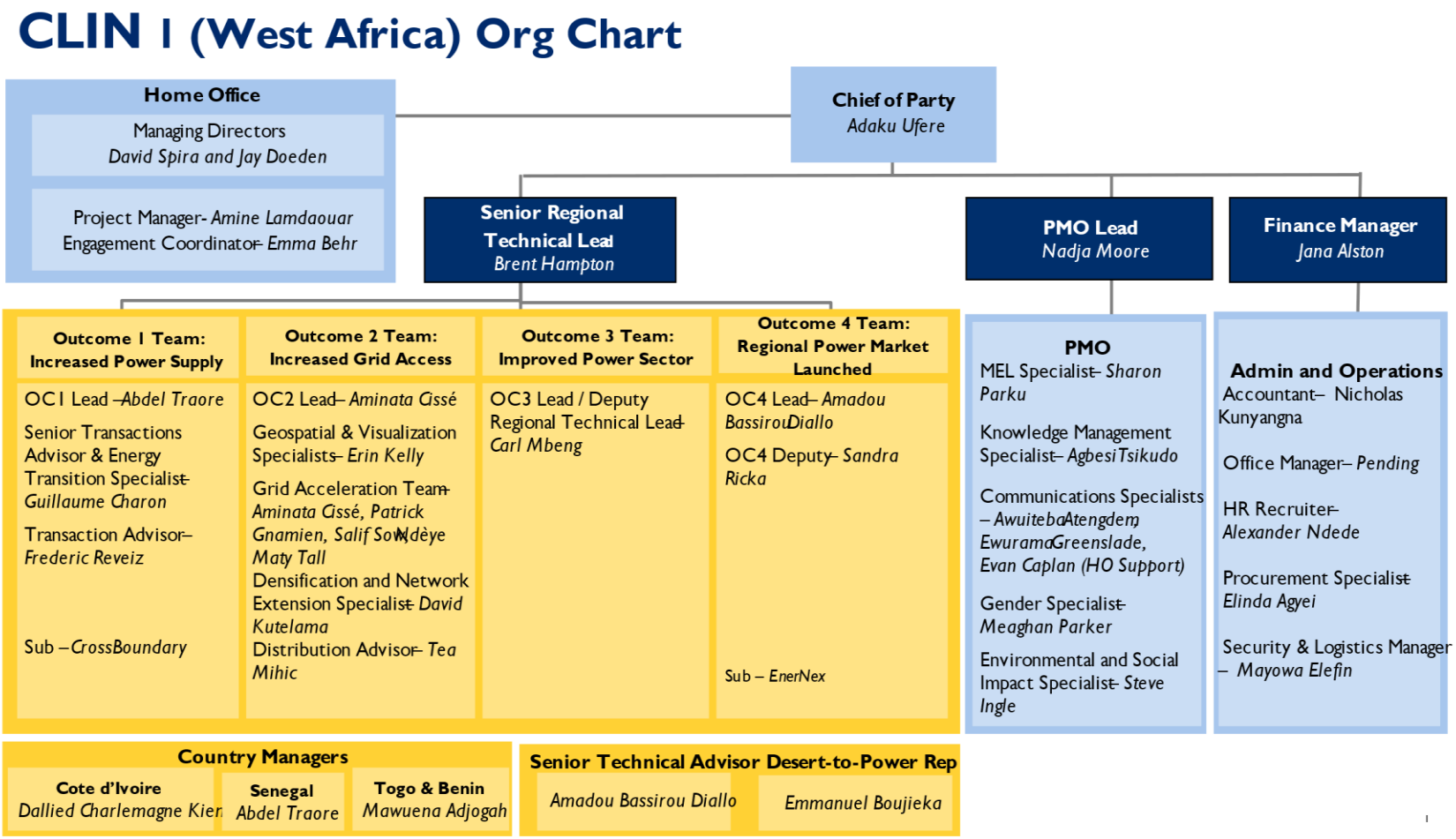
Table 3: Issues and Constraints Facing WAEP Implementation

Risks and Challenges – Description	Comments / Status / Mitigation
Political Force Majeure (Restrictions in pursuing activities in countries affected by military takeovers)	The WAEP team's inability to work with governments or state-owned entities in key countries including Guinea, Mali, and Burkina Faso, challenges the team's ability to achieve KPIs. The recent military coup in Gabon further compounds this challenge. Opportunities for working with the private sector in these countries remain very limited due to the volatile political environments in each.
Long lead times of Desert to Power (DtP) Program	Due to long lead times when implementing large-scale electrification projects, direct connections which would naturally yield from collaboration with counterparts result in anticipated connections rather than actual results. WAEP will selectively work on projects that will lead to actual connections rather than anticipated connections. In cases where the broader interests of Power Africa are reflected such as DtP, work will continue even though connections will be achieved beyond the Program's lifetime.

Inflation and Supply Chain Issues	Rampant inflation and rising interest rates have persisted in the sub region. These factors have had a negative impact on the progress of financial closure of IPP projects as well as construction of generation facilities, transmission lines and distribution infrastructure and connections. The team will mitigate this risk by providing guidance to the private sector and government counterparts on the best way to lessen the impact of these challenges.

APPENDICES

APPENDIX A: ORGANIZATION CHART



APPENDIX B: PROGRAM TRAVEL IN FY23

Table 4: Approved and Completed/Ongoing Travel for FY23

Purpose	Individuals	Start Date	End Date	Origin	Destination	Days in Country	Request Sent	Client Approval
Participate in the PACO's visit to Accra, Ghana and facilitate an in-person ancillary services training	Ibrahima Thiam	October 4, 2022	October 15, 2022	Dakar, Senegal	Accra, Ghana	11 days	Y	Y
Participate in the PACO's visit to Accra, Ghana	Sandra Ricka	October 4, 2022	October 15, 2022	Abidjan, Côte d'Ivoire	Accra, Ghana	11 days	Y	Y
To facilitate an in-person WAPP reliability assessment training organized by WAEP in Accra, Ghana	Ibrahima Thiam	November 6, 2022	November 10, 2022	Dakar, Senegal	Accra, Ghana	4 days	Y	Y
To introduce the Power Africa West Africa Energy Program (WAEP) to the USAID local mission and local power sector stakeholders	Abdou Mbaye	December 18, 2022	December 21, 2022	Dakar, Senegal	Yaonde, Cameroon	3 days	Y	Y
To introduce the Power Africa West Africa Energy Program (WAEP) to the USAID local mission and local power sector stakeholders	Abdou Mbaye	December 21, 2022	December 24, 2022	Yaounde, Cameroon	Kinsasha DRC	3 days	Y	Y
To introduce the Power Africa West Africa Energy Program (WAEP) to the USAID local mission and local power sector stakeholders	Carl Mbeng	December 18, 2022	December 21, 2022	Douala, Cameroon	Yaounde Cameroon	3 days	Y	Y
To provide PMO and technical support to the Acting Chief of Party	Krystal Chindori-Chininga	January 10, 2023	May 9, 2023	Harare, Zimbabwe	Accra, Ghana	120 Days	Y	Y

To meet with relevant energy stakeholders in the Benin	Brent Hampton	February 19, 2023	February 24, 2024	Accra, Ghana	Cotonou, Benin	5 Days	Y	Y
To meet with relevant energy stakeholders in the Benin	Abdou Mbaye	February 19, 2023	February 24, 2024	Dakar, Senegal	Cotonou, Benin	5 Days	Y	Y
To meet with relevant energy stakeholders in the Benin	Mawuena Adjogah	February 19, 2023	February 24, 2024	Lomé, Togo	Cotonou, Benin	5 Days	Y	Y
To meet with relevant energy stakeholders in the Benin	Ibrahima Thiam	February 19, 2023	February 24, 2024	Dakar, Senegal	Cotonou, Benin	5 Days	Y	Y
To conduct a generation project transaction advisory clinic for the Gabon Power Company (GPC)	Boris Adokou (Cross-Boundary)	March 8, 2023	March 15, 2023	Dakar, Senegal	Libreville, Gabon	8 Days	Y	Y
To provide PMO and technical support to the Acting Chief of Party	Krystal Chindori-Chininga	January 10, 2023	May 9, 2023	Harare, Zimbabwe	Accra, Ghana	120 Days	Y	Y
To support GIS training of AER and ENEO staff	David Kutelama	April 2, 2023	April 14, 2023	Kinshasa, DRC	Douala, Cameroon	12 Days	Y	Y
To attend meetings with stakeholders in the Energy Sector	Adaku Ufere	May 7, 2023	May 11, 2023	Accra, Ghana	Freetown, Sierra Leone	4 Days	Y	Y
To attend meetings with stakeholders in the Energy Sector	Brent Hampton	May 7, 2023	May 13, 2023	Accra, Ghana	Freetown, Sierra Leone	6 Days	Y	Y
To attend meetings with stakeholders in the Energy Sector	Brian Baltimore	May 7, 2023	May 13, 2023	Accra, Ghana	Freetown, Sierra Leone	6 Days	Y	Y

To undertake PEPT Impact field survey	Dallied Kien	May 11, 2023	May 17, 2023	Abidjan, CDI	Yamoussoukro, CDI	6 Days	Y	Y
To facilitate a capacity building training for SENELEC staff	Erin Kelly	May 21, 2023	May 27, 2023	Washington, DC	Dakar, Senegal	6 Days	Y	Y
To facilitate a capacity building training for SENELEC staff	Patrick Gnamien	May 21, 2023	May 27, 2023	Abidjan, CDI	Dakar, Senegal	6 Days	Y	Y
To open the training organized by WAEP for utilities of DRC and RoC	Aminata Cisse	May 21, 2023	May 27, 2023	Dakar, Senegal	Kinshasa, DRC	6 Days	Y	Y
To facilitate series of trainings for utilities of DRC and RoC	Gabriele Callegari	May 21, 2023	May 27, 2023	Milan, Italy	Kinshasa, DRC	6 Days	Y	Y
To facilitate series of trainings for utilities of DRC and RoC	Luca Giudici	May 21, 2023	May 27, 2023	Milan, Italy	Kinshasa, DRC	6 Days	Y	Y
To join series of trainings organized for utilities of DRC and RoC	Fiacre Lézin Dzila	May 21, 2023	May 27, 2023	Brazzaville, RoC	Kinshasa, DRC	6 Days	Y	Y
To join series of trainings organized for utilities of DRC and RoC	Boris Oppelet	May 21, 2023	May 27, 2023	Brazzaville, RoC	Kinshasa, DRC	6 Days	Y	Y
To join series of trainings organized for utilities of DRC and RoC	Aude Bissangou Yeba	May 21, 2023	May 27, 2023	Brazzaville, RoC	Kinshasa, DRC	6 Days	Y	Y
To join series of trainings organized for utilities of DRC and RoC	Brel Osnild Itoua	May 21, 2023	May 27, 2023	Brazzaville, RoC	Kinshasa, DRC	6 Days	Y	Y

To meet with SNEL to discuss SAIFI and SAIDI	Albert Bikele	May 27, 2023	June 3, 2023	Yaounde, Cameroon	Kinshasa, DRC	7 Days	Y	Y
To attend training organized by WAEP	Tchibamba Chester	May 27, 2023	May 31, 2023	Brazzaville, RoC	Yaounde, Cameroon	4 Days	Y	Y
To attend training organized by WAEP	Oyandza Mouadjombe Grace	May 27, 2023	May 31, 2023	Brazzaville, RoC	Yaounde, Cameroon	4 Days	Y	Y
To attend training organized by WAEP	Beangai, Fefionam Prosper	May 27, 2023	May 31, 2023	Bangui, Gambia	Yaounde, Cameroon	4 Days	Y	Y
To attend training organized by WAEP	Gbagodo Bruno Serge	May 27, 2023	May 31, 2023	Bangui, Gambia	Yaounde, Cameroon	4 Days	Y	Y
To attend training organized by WAEP	Berre Emmanuel	May 28, 2023	June 1, 2023	Libreville, CAR	Yaounde, Cameroon	4 Days	Y	Y
To attend training organized by WAEP	Messan Anguillet Northon	May 28, 2023	June 1, 2023	Libreville, CAR	Yaounde, Cameroon	4 Days	Y	Y
To facilitate a training organized by WAEP	Dali Faye	May 28, 2023	May 31, 2023	Paris, France	Yaounde, Cameroon	3 Days	Y	Y
To facilitate a training organized by WAEP	Yann-Ange Kouassi-Vanie	May 28, 2023	May 31, 2023	Paris, France	Yaounde, Cameroon	3 Days	Y	Y
To undertake PEPT Impact field survey	Patrick Gnamien	May 30, 2023	June 2, 2023	Abidjan, CDI	Bouake – Korhogo, CDI	3 Days	Y	Y

To undertake PEPT Impact field survey	Dallied Kien	May 31, 2023	June 4, 2023	Abidjan, CDI	Grand Bassam, CDI	4 Days	Y	Y
To meet with GIZ and ECREEE to discuss signing the statement of collaboration	Adaku Ufere	June 3, 2023	June 7, 2023	Accra, Ghana	Cape Verde	4 Days	Y	Y
To meet with GIZ and ECREEE to discuss signing the statement of collaboration	Carl Mbeng	June 3, 2023	June 7, 2023	Douala, Cameroon	Cape Verde	4 Days	Y	Y
To facilitate capacity building trainings for ELECTRA and Sao Tome Utility staff	Jose Luiz Cavaretti	June 5, 2023	June 16, 2023	Sao Paulo, Brazil	Praia, Cape Verde	11 Days	Y	Y
To accompany TOCOR to sector agency meetings	Brent Hampton	June 11, 2023	June 18, 2023	Accra, Ghana	Libreville, Gabon	7 Days	Y	Y
To deliver a training organized by WAEP	Augustin Kazakeviciu s	June 12, 2023	June 15, 2023	Washington, DC	Yaoundé, Cameroon	3 Days	Y	Y
To provide technical support to AER and ENEO staff	David Kutelama	June 18, 2023	June 25, 2023	Kinshasa, DRC	Douala, Cameroon	7 Days	Y	Y
To facilitate a 5 day in-person regional training organized by WAEP	Aminata Cisse	September 10, 2023	September 16, 2023	Dakar, Senegal	Abidjan, CDI	6 Days	Y	Y
To facilitate a 5 day in-person regional training organized by WAEP	Emmanuel Boujieka	September 10, 2023	September 16, 2023	Dakar, Senegal	Abidjan, CDI	6 Days	Y	Y
To facilitate a 5 day in-person regional training organized by WAEP	Ndeye Maty Tall	September 10, 2023	September 16, 2023	Dakar, Senegal	Abidjan, CDI	6 Days	Y	Y

To facilitate a 5 day in-person regional training organized by WAEP	David Kutelama	September 10, 2023	September 16, 2023	Kinshasa, DRC	Abidjan, CDI	6 Days	Y	Y
To participate in the 5 day in-person regional training organized by WAEP	Sala Ba	September 10, 2023	September 16, 2023	Nouakchott, Mauritania	Abidjan, CDI	6 Days	Y	Y
To participate in the 5 day in-person regional training organized by WAEP	Daha Sidaty	September 10, 2023	September 16, 2023	Nouakchott, Mauritania	Abidjan, CDI	6 Days	Y	Y
To participate in the 5 day in-person regional training organized by WAEP	Vitamatou Sid Elemine	September 10, 2023	September 16, 2023	Nouakchott, Mauritania	Abidjan, CDI	6 Days	Y	Y

APPENDIX C: TECHNICAL AND CONTRACTUAL DELIVERABLES SUBMITTED

Table 5: Deliverables submitted from October 2022 to September 30, 2023

Deliverable Title	Deliverable Description	Submission Date	Approval Date
Year 4 Environmental Monitoring and Mitigation Plan	Year 4 plan for environmental monitoring of program activities	September 1, 2022	September 28, 2022
WAEP Monthly Progress Report – August 2022	Program progress update for August 2022.	September 8, 2022 October 3, 2022	October 4, 2022
WAEP Roundtable Presentation	Presentation to Power Africa Coordinator outlining WAEP activities	October 5, 2022	-
WAEP Monthly Progress Report – September 2022	Program progress update for September 2022.	October 7, 2022 October 7, 2022 November 16, 2022	November 17, 2022
Climate Finance and Carbon Credit activities in Africa (Senegal and Côte d'Ivoire)	A document detailing information on Climate Finance and Carbon Credit activities in Senegal and Côte d'Ivoire, as well as Africa.	October 26, 2022	-
PESRM Checklist for Tobene	Completed Power Africa Environmental and Social Review Methodology checklist for Tobene.	October 27, 2022	-
PESRM Checklist for WAPGP	Completed Power Africa Environmental and Social Review Methodology checklist for WAPGP.	October 27, 2022	-
WAPGP ESIA Report	Environmental, Social and Health Impact Assessment Report.	October 27, 2022	
PESRM Checklist for Divo	Completed Power Africa Environmental and Social Review Methodology checklist for Divo.	October 27, 2022	-
PESRM Checklist for Betmai	Completed Power Africa Environmental and Social Review Methodology checklist for Betmai.	October 27, 2022	-
The Outlet-October Submission	Highlights of key achievements in October submitted for publication in the Outlet.	October 27, 2022	-

Deliverable Title	Deliverable Description	Submission Date	Approval Date
WAEP CLIN 1 Annual Progress Report - FY22 Y3	Program progress update for FY 2022.	October 28, 2022	December 10, 2022
WAEP CLIN 1 FY22 Y3 Environmental Mitigation and Monitoring Report	The EMMR provides a summary update on progress regarding mitigation and monitoring measures implemented as detailed in the EMMP for CLIN 1.	October 28, 2022 January 20, 2022	-
Power Africa Regional Fact Sheet	Highlights of impacts/achievements, priorities, and opportunities of WAEP submitted to Power Africa.	November 2, 2022 November 3, 2022	November 3, 2022
West Africa Energy Program Highlights	This document shows key highlights of WAEP.	November 2, 2022 November 3, 2022	November 3, 2022
Power Africa Annual Report	Story highlight for Power Africa Annual Report (requested by Power Africa Communications)	November 3, 2022	November 7, 2022 Onward submission to PA comms
WAEP Monthly Progress Report – October 2022	Program progress update for October 2022.	November 7, 2022 November 9, 2022 November 22, 2022 January 10, 2023	November 23, 2022
WAEP CLIN 1 Year 4 Work Plan	Program Planned Activities to meet specific LoP targets.	September 1, 2022 November 11, 2022 November 17, 2022 December 6, 2022	December 6, 2022
WAEP Monthly Progress Report – November 2022	Program progress update for November 2022.	December 8, 2022 January 7, 2023 January 17, 2023	January 23, 2023
CLIN 1 FY22 Environmental Mitigation and Monitoring Report (EMMR)	The EMMR provides a summary update on progress regarding mitigation and monitoring measures implemented as detailed in the EMMP for CLIN 1	October 28, 2022 February 10, 2023	

Deliverable Title	Deliverable Description	Submission Date	Approval Date
CLIN 1 Revised MEL Plan	Overall approach to monitoring and evaluating updated activity targets using agreed-upon indicators	January 17, 2023	-
WAEP Monthly Progress Report – December 2022	Program progress update for December 2022	January 10, 2023 January 25, 2023	January 26, 2023
WAEP Quarterly Report FY23 Quarter 1	Program progress update for FY 2023 Quarter 1	January 30, 2023 February 15, 2023	February 16, 2023
WAEP Monthly Progress Report – January 2023	Program progress update for January 2023	February 8, 2023 February 10, 2023 February 15, 2023	February 16, 2023
WAEP Monthly Progress Report – February 2023	Program progress update for February 2022	March 8, 2023 March 13, 2023 March 23, 2023	March 23, 2023
WAEP Overview Presentation (requested by TOCOR)	Powerpoint presentation on Program overview achievements to dates	May 10, 2023	-
WAEP Monthly Progress Report – March 2023	Program progress update for March 2022	April 11, 2023 April 27, 2023	April 27, 2023
WAEP CLIN 1 Quarterly Progress Report – FY23 Quarter 2	Program progress update for FY23 Quarter 2	April 28, 2023 June 2, 2023 June 23, 2023 July 14, 2023	July 14, 2023
WAEP Monthly Progress Report - April 2023	Program progress update for April 2023	May 8, 2023 May 18, 2023 May 24, 2023	May 18, 2023

Deliverable Title	Deliverable Description	Submission Date	Approval Date
WAEP Monthly Progress Report - May 2023	Program progress update for May 2023	June 8, 2023 June 19, 2023	June 20, 2023
Sierra Leone Mission Trip Report	Report detailing the WAEP team's trip to Sierra Leone	May 25, 2023	
Cabo Verde Mission Trip Report	Report detailing the WAEP team's trip to Cabo Verde	June 11, 2023	
Assessment report	SAIDI and SAIFI Assessment Report	June 22, 2023	
Mission Report	DRC Mission Report	June 22, 2023	
Vendors and Subcontractors for West Africa Report	Vendors and Subcontractors for West Africa	June 14, 2023 June 23, 2023	
WAEP Overview Presentation (requested by TOCOR)	Powerpoint presentation on Program overview achievements to dates	May 10, 2023	-
WAEP Monthly Progress Report - April 2023	Program progress update for April 2023	May 8, 2023 May 18, 2023 May 24, 2023	May 18, 2023
WAEP Monthly Progress Report - June 2023	Program progress update for June 2023	July 10, 2023 August 2, 2023	August 3, 2023
WAEP CLIN 1 Quarterly Progress Report Q3	Program progress update for FY23 Q3	July 28, 2023	September 8, 2023
Trip Report - Attendance at PAOP closeout Monrovia, Liberia	Summary of trip to Liberia and PAOP closeout meeting	August 7, 2023	
WAEP Monthly Progress Report-July 2023	Program progress update for July 2023	August 8, 2023	August 29, 2023
PEPT Training Report	PEPT training overview and summary	August 14, 2023	

Deliverable Title	Deliverable Description	Submission Date	Approval Date
CLIN 0001 - Year 5 Work Plan	Proposed WAEP strategy and activities for Year 5	September 1, 2023 October 10, 2023	
WAEP Monthly Progress Report- August 2023	Program progress update for August 2023	September 8, 2023 October 5, 2023	October 6, 2023

APPENDIX D: DETAILED ACTIVITY PROGRESS

The table below provides a status overview of WAEP activities in accordance with the approved Regional Year 4 Work Plan. This table tracks the status of activities and highlights any activity changes, timing changes or other major items related to activities that the WAEP team would like to amend for the period. Any activities crossed out have been removed from the Work Plan and activities highlighted in red are amended/newly added activities to the Year 4 WAEP Work Plan.

Outcome 1

Table 6: Outcome 1- Detailed Activities and Results

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
Intermediate Result 1.1				
Collaborate with AfDB on DtP to increase MWs (and connections) Y4.C1.IR1.1-T1.a REG	DtP WAEP Representative	Y3Q1 – Y4Q4	• Transaction advisory for bidding and negotiation, power sector planning and project oversight	**In progress:** The WAEP team supported the AfDB to prepare its presentation slides—for the workshop on accelerating electrification projects in the Sahel held in Abidjan from September 11-15, 2023. The DtP side event at the Africa Climate Summit initially planned for September 4, 2023, has been canceled and will instead be incorporated into a high-level event focused on "Harnessing Africa's Renewable Energy Potential". The DtP initiative will be highlighted during this event. The WAEP and DtP teams worked alongside McKinsey & Company to prepare for the session, which includes the event program, keynote speech and the closing remarks by the AfDB President. The collaboration will continue in Y5. .
Provide transaction advisory support to advance renewable energy in West Africa (Cameroon, Sierra Leone, Gambia, Côte d'Ivoire, Senegal, Gabon) Y4.C1.IR1.1-T2.a REG	STA, OCI Lead	Y3Q1-Y4Q4	• Further developed pipeline of projects and transaction advisory support	**In progress:** The team is providing transactional support to Senegal and Côte d'Ivoire, with some prospects for other countries. In Senegal and Benin, the support is to advance the energy transition strategy while in Côte d'Ivoire, the plan is to strengthen the capacity of DGE to take meaningful decisions for a series of solar PV projects close to 200MW in total installed capacity. In Senegal the work is continuing to phase 3 of the utilization of LNG to catalyze the transition and leverage the funding from G7 countries under the Just Energy Transition. The support to DGE includes financial

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
				modeling tools, tariff settings and other relevant tools towards securing relevant deals in solar PV projects from IPPs and the latest deliverable has been submitted to the counterparts pending potential feedback The team is tracking and supporting at least three projects (hydro and GtP) expected to reach FC in Y4 in Gabon. The team held the kick-off meeting on June 26, 2023 with GPC to immediately start the delivery. The demand assessment work was completed before the coup. In September 2023, the power utility of Liberia formally expressed the need to have WAEP support of Transaction advisory concerning contract review and PPA and power supply agreement support as it relates to an urgent 100 MW provision to the grid in Liberia.
Provide advisory support to the renewable transition through decarbonization, fuel switch, loss reduction, and efficiency improvement, with possible countries including Benin, Togo, Burkina Faso, Cameroon, Mauritania, Côte d'Ivoire, and Senegal Y4.C1.IR1.1-T2.a REG	Energy Transition Specialist,	Y2Q1 – Y4Q4	• Advisory support • Report • Workshops	**In Progress:** The work on decarbonization is currently active in Senegal, Benin, and Gabon. In Senegal, the WAEP team delivered the second report to the counterpart, elaborating on best routes and strategies to secure the best path toward energy transition by appropriate use of natural gas. In March 2023, the team submitted a first draft of GHG simulation against the NDCs of Senegal. In early June 2023, the team conducted a field trip to capture key insights relevant to designing the next round of support to Senegal. The intention is to support the preparation of Senegal to secure financing from G7 countries under the JET scheme. The meeting with the Minister did not happen due to unrest in the country. Phase 3 has been introduced to the counterpart and will continue once feedback is received on the approach. In Benin, the WAEP team submitted the second report focusing on financial entities that support energy transition and clean energy projects. The team presented the work to the Ministry of Energy and Ministry of Finance in April 2023. The WAEP team has started work with the regulator on the tariff design.

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
				The WAEP team launched support in Gabon on June 26, 2023, to discuss securing funding for energy transition through fuel switch on two power plants. Provided the authorization is granted to proceed ahead with collaboration with Gabon, the initiated activity will continue.
Intermediate Result 1.2				
Prepare proposed technical assistance to support/trigger revision of Master Plans in at least two countries (Cameroon, Togo, Benin, Senegal, Sierra Leone, Cape Verde, Sao Tome, and Côte d'Ivoire) Y4.C1.IR1.2-T2.a REG	Energy Transition Specialist	Y2Q1 – Y4Q4	• Advisory support	**In progress:** The WAEP team assisted authorities on a mutually beneficial strategy to deploy and use cleaner sources of fuel for the Senegalese power sector. The WAEP team developed a set of Gas-to-Power alternatives to compare them and provide the most-needed elements for the decision-making on the Gas-to-Power strategy. Authorities were appreciative of the high quality of work produced by the WAEP team. The team planned to present in person early in Q3 of FY 23 but was postponed because of recent events in Senegal. The new date is yet to be defined. Similar work is being developed for Benin, where the revised report was submitted in February 2023 with a second report in April 2023. The team will formally ensure and confirm that the counterpart will undertake this work. In Gabon, the team has conducted the demand assessment for two GtP plants in a support under energy transition. The integration of key findings will inform the revision of the master plan among other impacts.
Intermediate Result 1.3				
Prepare proposed technical assistance to support/trigger revision of Master Plans in at least two countries (Cameroon, Togo, Benin, Senegal, Sierra Leone, Cape Verde, Sao Tome, and Côte d'Ivoire) Y4.C1.IR1.3-T1.a REG	OC1 Lead	Y3Q1 – Y4Q4	• Validated approaches recommendations on design of financial models. • Training on competitive procurement process	**In progress**: For selected countries, OC1 jointly with OC3 and country managers are delivering specific regional training to relevant agencies in PPP structuring around a generation project. The support targets technical and financial appraisal techniques along with some legal aspects.

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
			• Training on technical and financial evaluation of offers. • Training on power project finance • Training in distribution project economic and financial analysis • Training in generation/IPP project financial analysis / power project finance	
Provide advisory services at level of Ministry of Energy or coordinating unit to advance generation projects in the following countries, if receptive: Cameroon, Togo, Benin, Senegal, Sierra Leone, Cape Verde, Sao Tome, and Côte d'Ivoire Y4.C1.IR1.3-T1.b REG	OC1 Lead, Energy Transition Specialist	Y3Q1-Y4Q4	• Sharing knowledge on leading practice to design and appraise renewable energy related PPAs • Technical consideration for improved preparedness of the infrastructure • Sharing knowledge on leading approaches to decarbonize power generation	**In progress**: WAEP has prepared Energy Transition Strategies for the Ministries of Energy in Senegal and Benin and prepared the first deliverable for Gabon just before the coup. The overall strategy focuses on decarbonization through renewables and cleaner gas-to-power transitions for the first two countries, whereas for the latter, it will discuss the best way to utilize natural gas as a way to achieve energy transition. In Q3 of FY 23, the team presented the simulation tool for GHG to the SPE in Senegal based on the NDCs. The team intends to replicate, in a contextualized way, this support in Benin and Gabon. .
Intermediate Results 1.4				
Provide advisory support to the renewable transition through decarbonization, fuel switch, loss reduction, and efficiency improvement, with possible countries including Benin, Togo, Burkina Faso,	Energy Transition Specialist, OC1 Lead	Y2Q1 – Y4Q4	• Advisory support • Report • Workshops	**In progress:** The work on decarbonization is currently active in Senegal Benin, and Gabon. In Senegal, the WAEP team delivered the second report to the counterpart; elaborating on best routes and strategies to secure the best path toward energy transition by appropriate use of natural gas.

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
Cameroon, Mauritania, Côte d'Ivoire, and Senegal Y4.C1.IR1.2-T2.a REG				In March 2023 the team submitted a first draft of GHG simulation against the NDCs of Senegal. The intention is to support the preparation of Senegal to secure financing from G7 countries under the JET scheme. The team is waiting for feedback from the SPE to deploy the phase 3 of this support. In Benin, the WAEP team submitted the second report focusing on financial entities that support energy transition and clean energy projects. The team will now prepare a presentation to relevant stakeholders for an interactive session on the report.
Provide transaction advisory support to advance renewable energy in West Africa (Cameroon, Sierra Leone, Gambia, Côte d'Ivoire, Senegal, Gabon) Y4.C1.IR1.3-T2.b REG	STTA, OCI Lead	Y3Q1-Y4Q4	• Further developed pipeline of projects and transaction advisory support	**In progress:** The WAEP team is assisting the Ivorian Ministry of Energy to evaluate three solar projects: Korhogo (25MW), Bondoukou (50MW), and Kong (30MW). For each project, the WAEP team provided support on the project concession agreements, which included a review of the development, financing, construction, and operation of the plants. Power Africa then advised DGE on provisions that protect the government without negatively impacting the financial feasibility of the projects. These projects are expected to come online within the next two years. The WAEP team is providing transaction advisory support for two renewable energy projects in Sierra Leone: Solar Era (25MW) and Betmai Hydropower (28MW). The WAEP team has assisted the project sponsors with identifying and securing senior debt and concessional finance for the projects.

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
Provide light-touch gender mainstreaming support to select developers Y4.C1.IR1.4-T2.a REG	Gender Specialist,	Y3Q1 – Y4Q4	• Recommendations to developers on how to tangibly integrate gender into project development, utilizing existing tools (e.g., EU framework, PAOP resources, etc.) • Tailored gender mainstreaming technical assistance to individual developers depending on specific needs	**Not started**
Intermediate Results 1.5				
OMVG PMU for Guinea/Gambia/Guinea Bissau/ Sierra Leone/Senegal Y4.C1.IR1.5-T2.a REG	OC4 and OC1 Teams	Y4Q1-Y4Q4	• Assistance according to NAST results	Cancelled: No activity was delivered to the PMUs during Y4.
OMVS PMU for additional Mali/Senegal interconnector Y4.C1.IR1.5-T2.b REG	OC4 and OC1 Teams	Y4Q1-Y4Q4	• Assistance according to NAST results	Cancelled: No activity was delivered to the PMUs during Y4.
North Core PMU for Nigeria/Benin/ Niger/Burkina Y4.C1.IR1.5-T2.c REG	OC4 and OC1 Teams	Y4Q1 - Y4Q4	• Assistance according to NAST results	Cancelled: No activity was delivered to the PMUs during Y4.
Guinea-Mali interconnection (PIEGM) Y4.C1.IR1.5-T2.d REG	OC4 and OC1 teams with	On hold	• Assistance according to NAST results	

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
	external consultant support			Cancelled: No activity was delivered to the PMUs during Y4.
CLSG PMU for Côte d'Ivoire/ Liberia/Sierra Leone/Guinea Y4.C1.IR1.5-T2.e REG	OC4 and OC1 Teams	Y4Q1-Y4Q4	• Possible assistance depending on final NAST results	Cancelled: No activity was delivered to the PMUs during Y4.
Intermediate Results 1.6				
Ad-hoc review of partner's Environmental Management System (EMS) and E&S policies Y4.C1.IR1.6-T1.a REG	ESIA Specialist	Ad hoc	• Review existing environmental and social policies and EMS and advise on potential gaps which may affect bankability	**In progress:** Ongoing review of EMS and E&S policies
Assist partners in reviewing or preparing tender documents for project related ESIA processes. Environmental and social screening of the WAEP team-supported transactions per the PESRM Checklist Y4.C1.IR1.6-T2.a REG	ESIA Specialist	Y1Q1 – Y4Q4	• Complete PESRM checklist for each WAEP-supported transaction. • Preference will be given to transactions with a strong score per the fit-check analysis	**In Progress:** Ongoing. No PESRM Checklists were prepared for the period.
Conduct ad-hoc third-party peer review or QA of subcontracted ESIA or EMS documentation Y4.C1.IR1.6-T2.b REG	ESIA Specialist	Y1Q1 – Y4Q4	• Memo to partner indicating bankability of EMS/ESIA documentation	**Not started**

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
Technical assistance to project developers for reviews of hydro, GTP, solar PV, biomass, and other projects Y4.C1.IR1.6-T2.c REG	ESIA Specialist	Ad-Hoc	• Technical assistance reports on activities conducted to support developers with appraisal for E&S impacts and sustainability,	**Not Started**

Outcome 2

Table 7: Outcome 2- Detailed Activities and Results

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
Intermediate Result 2.1				
Provide technical assistance and capacity strengthening in electrification planning and implementation to improve large-scale connections efforts in DRC and RoC Y4.C1.IR2.1-T2.a REG	Senior Distribution and Grid Extension Advisor	Y4Q1 – Y4Q4	• Electrification programs project management • Consider replication of PEPT training (adapting PEPT training prepared for Benin and Togo) • Capacity building on electrification planning tools	**Completed:** The WAEP team supported stakeholders in DRC and RoC on three main topics: (1) electrical studies for power distribution infrastructure, (2) design, financing, implementation, and monitoring of universal electricity access programs and (3) management of electrification projects. The first training, on electrical studies, was delivered from May 22 - 26, 2023 in Kinshasa, to staff from the DRC utility SNEL and staff from the RoC utility E2C. The second training, on the design, financing, implementation, and monitoring of universal electricity access programs was delivered from July 3 to July 7, 2023 in Kinshasa, to participants from SNEL, from the DRC electrification agency ANSER, the DRC Ministry of Energy, and to the rural electrification agency of RoC, ANER. The last training, on the management of electrification projects was delivered virtually from August 28 to September 1, 2023 to SNEL, ANSER, ANER and E2C.
Provide technical assistance and capacity strengthening in electrification planning and implementation to improve large-scale connections efforts in Central Africa	Senior Distribution and Grid Extension Advisor	Y4Q1 – Y4Q4	• Support on electrification planning and connections programs financing and implementation • Replication of PEPT training for Benin/Togo	**Canceled: T**he WAEP team has not been able to engage with counterparts in the Central African Republic. In Gabon, the utility SEEG indicated that their priority was mostly losses reduction activities. On the electrification front, they suggested activities on

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
Y4.C1.IR2.1-T2.b REG			• Technical training / design of electrification infrastructure; supervision and monitoring of electrification projects replicating Cameroon model	GIS and digitization that WAEP would not be able to carry out because of the short time remaining for the program.
Improve tracking and management of electrification projects and projects administered by other directorates/ departments within the Ministry of Energy in Benin Y4.C1.IR2.1.T3.b BN	OC2 Lead	Y2Q3 – Y4Q2	• Coordination Unit framework • TOR for Project Coordination Unit • Design Options for Project Management and Tracking Tool • Improved project management tool • PEPT training delivered jointly to Togo and Benin counterparts • In-person training on coordination tool • In-person working session on coordination unit	**In Progress:** The only workstream left on this activity is the Project Management and Tracking Tool (dashboard). The tool was already developed by the WAEP team, and a handover between WAEP and DGRE should be arranged for next quarter.
Regionalization of GIS Dashboard to further regional electrification Y4.C1.IR2.1.T3.a REG	GIS Specialists	Y4Q1-Y4Q4	• Regional GIS dashboard showing data from Togo, Benin, Senegal, Niger • Capacity building on GIS	**In Progress:** The dashboard work was completed in Senegal. In Benin, the tool was completely built out and the only milestone left is the dashboard handover to DGRE. In Togo, the preliminary phase of the dashboard, around creating a digital data collection framework, was completed. The WAEP team has started building out the dashboard tool, based on the data received so far from the utility CEET. In Niger, the dashboard work was paused, pending guidance from USAID regarding collaboration with the Nigerien government. Capacity building on GIS is on hold in Togo due to another ongoing GIS project with CEET.
Support to ECOWAS on regional electrification programs implementation and monitoring	OC2 Lead and Deputy	Y4Q1-Y4Q4	• Training on electrification program implementation • Dashboard or tool potentially	**Canceled:** The WAEP team has been unable to engage with ECOWAS.

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
Y4.C1.IR2.1.T3.b REG				
Conduct PEPT Impact Evaluation Study Y4.C1.IR2.1.T4.a REG	Grid Acceleration Team Member,	Y4Q1 – Y4Q4	• PEPT Excel-based models • PEPT socio-economic impact study report • PEPT socio-economic impact study presentation to CIE	**In Progress:** The WAEP team finalized the consumer behavior analysis and macroeconomic analysis deliverables, based on the team's collective review and on CIE comments. The field survey across Côte d'Ivoire was completed, and the data cleaning process done. The drafts of the two following deliverables (preliminary results analysis and comparative results analysis) were shared with CIE for review. The final deliverable of the study, which is the overall PEPT socio-economic impact report, was updated following the feedback received from CIE during the final restitution workshop, held in-person, in Abidjan, on November 8th and 9th, 2023.

Desert to Power Connections Efforts with AfDB
 	
Y4.C1.IR2.1-T5.b REG
	DtP WAEP Representative	Y3Q1 – Y3Q4	• Regional Trainings on the following topics
			  ○ Project Management on Network Optimization
			  ○ PEPT Best Practices and Regional Exchange
			• Online trainings
				In Progress: Building on the "Gender Mainstreaming" training in March 2023, the dashboard work began with the Niger utility Nigelec in April 2023 but was paused due to the political situation in Niger. The training on electrification projects management took place virtually from August 28th to September 1st 2023. The capacity building workshop on network optimization for G5 Sahel countries took place in Abidjan from September 11th to September 15th 2023. This workshop was co-financed by the Islamic Development Bank and was delivered under the African Development Bank Desert to Power umbrella. Lastly, the end-of-program regional exchange webinar series on best practices and lessons learned in universal electrification programs will kick-off in October 2023.

Provide technical assistance and capacity strengthening to AER and Eneo for the effective implementation of electrification efforts, including the PERACE program Y4.C1.IR2.1-T5.c REG	Senior Distribution and Grid Extension Advisor	Y4Q1 – Y4Q4	• Electrification programs project management • Consider replication of PEPT training (adapting PEPT training prepared for Benin and Togo) • Capacity building	**Completed:** The WAEP team delivered a GIS training to AER and Eneo in April 2023 and a second training, on prepayment systems and electrification equipment, in June 2023. Both counterparts also joined the electrification projects management training that took place in August 2023.
Intermediate Result 2.2				
Ongoing regional support to DtP to support financing and acceleration of access programs	DtP WAEP Representative,	Y3Q1 – Y3Q4	High-level support to DtP Task Force	**In Progress:** The WAEP team is supporting the DtP initiative via the DtP Task Force.

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
Y4.C1.IR2.2-T3.a REG				
Assistance to Togo Ministry of Energy to effectively roll out and scale national PEPT, Fonds Tinga Y4.C1.IR2.2-T3.a TG	Togo Country Manager, Grid Acceleration Team	Y3Q1 – Y3Q4	• Written update on Legal Act of Creation of the Fund • Leading practice guidelines and criteria for procurement of management company for the Fund • Electrification Action Plan for the first 15,000 • Launch of international donors funding process • Procedures for the deployment of Fund "Tinga" • Capacity building on implementation of PEPT (in person with regional approach – Togo / Benin)	**In Progress**: This Year, the WAEP team continued to support operationalization of Fonds Tinga through the utility CEET, to advance the realization of connections. The team is now focusing on the development of a project monitoring dashboard. CEET participated in the electrification projects management training that took place at the end of Year 4, along with the Togolese agency for rural electrification AT2ER.
Intermediate Result 2.3				
Support Senelec to implement Readyboard Solution to address electrification barriers Y4.C1.IR2.3-T2.a SEN	Grid Acceleration Team,	Y4Q1 – Y4Q4	• Diagnostic report on the current internal wiring situation and regulatory requirements • Implementation and deployment plan for the ready board program • Certification of wiring professionals package	**In Progress:** The WAEP team completed the cost analysis of the readyboard and assisted the Senelec team in drafting the readyboard technical specifications. Both teams are currently working on the training program for electricians, and on the update of Senegalese internal wiring regulations.

Outcome 3

Table 8: Outcome 3- Detailed Activities and Results

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
Intermediate Results 3.1				
Technical Assistance and workshop on tariff methodology design, financial modeling for energy projects, and the establishment of standard power sector contracts Y4.C1.IR3.1-T1.b REG	Regional OC3 Lead	Y4Q2–Y4Q3	• Baseline data – information on existing tariff rates and tariff methodology • Training materials • Tariff methodology development guide/roadmap of document • Proof of adoption of guides established by counterpart • Letters of appreciation from counterparts • Standard financial model Guide for Renewable Energy projects to be shared and adopted by participants.	**Completed.**
Intermediate Results 3.2				
Light touch advisory support to ELECTRA on non-technical loss reduction Y4.CI.IR3.2-T1.a CV	OC 3 Lead	Y4Q1 – Y4Q4	• Training materials • Technical support • Personalized loss analysis and loss combat plan	**Completed**
Technical Assistance to improve SAIDI & SAIFI reporting and mitigating frequency and duration of outages in Côte d'Ivoire, Cameroon, and Togo Y4.C1.IR3.2-T6.a REG	Electric Power Outage Management Expert (French Speaking)	Y4Q1 – Y4Q4	• Baseline data for SAIDI, SAIFI and MAIFI • Practical Guide on SAIDI, SAIFI and MAIFI data collection and reporting and mitigation mechanisms. • Training Materials • Letters of appreciation from counterparts • Revised baseline data (after 6 months of tracking)	**Completed**
Intermediate Results 3.3				
Technical Assistance to develop guides, roadmaps, and regulatory instruments to enhance private sector participation in the	Regional OC3 Lead	Y4Q1– Y4Q4	• Draft regulatory instruments, guides, plans, • Training Materials • Letters of appreciation	**Completed**

Activity	Activity Manager(s)	Start/End Dates	Deliverable(s)	Status
power sector (Continuation of Y3 competitive procurement activity) Y4.C1.IR3.3-T1.a REG			• Guidelines/roadmaps	
				Cancelled: ERERA declined the support noting that it was no more a priority

Outcome 4

Table 9: Outcome 4 - Detailed Activities and Results

Activity	WAEP Activity Manager (s)	Start/End Dates	Deliverable(s)	Status
Intermediate Results 4.1				
Build ERERA's capacity to implement Market Regulations for WAPP's real-time energy exchange Y4.C1.IR4.1-T1.a REG	OC4 Lead	Y3Q1 – Y5Q2	• Policy Paper • Implementation roadmap • Training Reports	**In progress:** Scope of work to be finalized following ERERA comments on the first draft submitted by the WAEP team. A meeting with ERERA to discuss monitoring tools is scheduled on July 28, 2023.
Develop a WAPP endorsed Project Implementation Manual (PIM) for WAPP Member PMUs Y4.C1.IR4.1-T1.b REG	OC4 Lead	Y4 Q1 – Y5 Q2	• Regional PIM endorsed by WAPP to be used as a guiding document for all Interconnector projects	**Cancelled:** This activity is cancelled due to budget restrictions
Re-run of security assessment studies and deliver training	OC4 Lead	Y3Q3 – Y5Q2	• Security assessment report • Training report	**In progress**: The activity is included in the program validated by WAPP following the WAEP mission in Cotonou. A draft scope of work was sent to WAPP/ICC for review and comments.
Intermediate Results 4.2				
Provide capacity building support for operations Personnel of WAPP Member PMUs within WAEP-WAPP exchange forum (GIS) Y4.C1.IR4.2-T3.a REG	OC4 Lead	Y4Q1 – Y4Q4	• GIS training • Gender mainstreaming in energy training • Training materials • Training report	**Cancelled:** This activity is cancelled due to budget restrictions
Strengthen PMUs capability to manage environmental, safety, and compensation issues Y4.C1.IR4.2-T3.b REG	OC4 Lead	Y4Q1 – Y4Q4	• Resettlement action plan training • Training materials • Training reports	**Cancelled:** This activity is cancelled due to budget restrictions
Strengthen PMU's monitoring and evaluation and performance reporting capacity Y4.C1.IR4.2-T3.c REG	OC4 Lead	Y4Q2 – Y4Q4	• Monitoring and evaluation and performance reporting training • Training materials	**Cancelled:** This activity is cancelled

Activity	WAEP Activity Manager (s)	Start/End Dates	Deliverable(s)	Status
			• Training reports	
Training on the use the basic principles of the planning software of PLEXOS	OC4 Lead	Y4Q3 – Y5Q2	• Software of Plexos reporting training • Training materials • Training reports	**Cancelled:** This activity is cancelled due to budget restrictions
Intermediate Results 4.3				
Developing online knowledge testing system for the operators Y4.C1.IR4.3-T1.a REG	OC4 Deputy	Y4Q1 – Y4Q4	• List of questions • Online knowledge testing platform • Training	**Cancelled**: This activity is cancelled by WAPP
Facilitate real-time data exchanges between WAPP ICC and national control centers Y4.C1.IR4.3-T2.a REG	OC4 Deputy	Y4Q1 – Y4Q4	• Develop OSI Soft PI System (this can also be funded by a different donor not necessary USAID) • Connect OSI Soft to the CAC, NCC, and WAPP ICC to start real-time data gathering • Develop analytical functions • Develop visualization and report templates that WAPP ICC can use to share information with member utilities and regulators.	**Cancelled**: This activity is not included in the program validated by WAPP following the WAEP mission in Cotonou.
Data analysis and visualization Y4.C1.IR4.3-T2.b REG	OC4 Deputy	Y4Q1 – Y5Q2	• Develop OSI Soft PI System (this can also be funded by a different donor not necessary USAID) • Connect OSI Soft to the CAC, NCC, and WAPP ICC to start real-time data gathering • Develop analytical functions • Develop visualization and report templates that WAPP	**Cancelled:** This activity is cancelled due to budget restrictions

Activity	WAEP Activity Manager (s)	Start/End Dates	Deliverable(s)	Status
			ICC can use to share information with member utilities and regulators.	
Improving process for data gathering and updating the existing WAPP ICC regional model (development of data update framework) Y4.C1.IR4.3-T2.c REG	Power System Advisor	Y4Q1 – Y5Q2	• Report on existing models used by member utilities and possibility to make the models easily read and translated into the formats WAPP ICC can use. • Data collection automated process • Data evaluation tool	**Cancelled:** This activity is cancelled due to budget restrictions

Cross-cutting Activities

Table 10: Cross cutting- Detailed Activities and Results

Activity	WAEP Activity Manager (s)	Start/End Dates	Deliverable(s)	Status
Communications and Outreach				
Monthly and quarterly progress reporting Y4.C1.COMM-c	COMM Specialist, PMO Lead	Y1 Q1 – Y4 Q4	• Monthly and quarterly reports	**Ongoing:** Submitted monthly and quarterly reports for the period.
Social media content Y4.C1.COMM-d	COMM Specialist	Y1 Q1 – Y4 Q4	• Social media posts	**Ongoing** Submitted content to feature on Power Africa's social media platforms (Facebook, Twitter, and LinkedIn)
Success stories Y4.C1.COMM-e	COMM Specialist, PMO Lead, MEL Specialist	Y1 Q1 – Y4 Q4	• Success stories	**Ongoing:** Success stories submitted to TOCOR and posted on the Power Africa Medium platform
Strategic Stories across the regional press landscape Y4.C1.COMM-j	Comms Specialists, OC Leads	Y4Q1 – Y4Q4	• One-pager • News articles • Press releases (across media platforms) •	**Ongoing**
Branding and marking technical reports and/or learning guides Y4.C1.COMM-k	Comms Specialists, OC2 Lead	Y4Q1 – Y4Q4	• Monthly, quarterly, and annual reports • Other guides	**Ongoing**
Environmental Monitoring and Mitigation				

Activity	WAEP Activity Manager (s)	Start/End Dates	Deliverable(s)	Status
E&S review of contracts packages and contractor management plans Y4.C1.ENV-a	ESIA Specialist	Y1Q1 – Y4Q4	• Complete PESRM checklists	**Ongoing**
Environmental and social impact technical assistance as requested by technical leads and outlined in the Program EMMP Y4.C1.ENV-b	ESIA Specialist	Y1Q1 – Y4Q4	• Deliverables per Activity SoW	**Ongoing**
MEL				
Maintain and implement reporting templates and data documentation. Y4.C1.MEL-a	MEL Specialist, PMO Lead	Ongoing	• Utility reporting templates	**Ongoing**
Data collection, verification, and documentation of Program Results Y3.C1.MEL-b	MEL Specialist PMO Lead	Ongoing	• Quarterly Submission of Program Results	**Ongoing:** Activity leads submit data on indicator results together with justification documents to the MEL team for review/verification and reporting
Qualitative MEL assessment and reporting Y3.C1. MEL-c	MEL Specialist, Comms Specialist	Y1 Q1 – Y4 Q4	• Quarterly success stories	**Ongoing:** Work with the Communications team to develop success stories in the reporting quarter
Gender Mainstreaming				
Women Energy Champions (WEC) Series Y4.C1.GEN-a	Gender Specialist, Gender Adviser	Y1 Q1 – Y4 Q4	• Women Energy Champions profiles	**Ongoing**
Gender learning and networking events Y3.C1.GEN-b	Gender Specialist, Gender Adviser	Y3Q2 – Y4Q4	• Proceedings of events	**Ongoing**
ESWLI Y4.C1.GEN-d	Gender Specialist, Gender Adviser	Y2Q2 – Y4Q4	• Training Reports	**In Progress:** Preparation underway for 3rd ESWLI cohort in October 2023
West African Girls in STEM Webinar Series Y3.C1.GEN-e	Gender Specialist, Gender Adviser	Y2Q3– Y4Q4	• Webinar reports	**In Progress: Held first in person** "Empowering Girls in STEM" event in Ghana in May 2023 and planning a similar event in Côte D'Ivoire in October 2023

APPENDIX E: PERFORMANCE INDICATOR TRACKING CHART

The table below illustrates the progress of the Program against approved indicators

Table 11: Program Performance against Indicators

No	No. Indicator	LoP	Total Results to Date	% Achieved against LoP	Y1-Y3 Actuals	Year 4 Target	Year 4 Results	% Achieved against Year 4 Target	Notes
1	Generation Capacity Reached Financial Close: Number of MW from transactions that achieved financial close (PA #8)	8000 MW	1,977MW	25%	1,912 MW	1,815 MW	**64.5**	4%	Global supply chain constraints, increased project costs and political instability in the region has affected the Program's ability to achieve LoP
2	Wholesale cost of generation	Reduced by 20% in at least 3 countries	3	100%	2	2	**1**	50%	LoP Target Achieved
3	Kilometers of Power Lines Constructed or Rehabilitated: The sum of linear kilometers of new, reconstructed, rehabilitated or upgraded transmission and distribution lines that have been energized, tested, and commission/installed with USG, development partner or private sector partner support (PA#19)	3,800 km	3,711 km	98%	2,324 km	1,272 km	**1,387.14**	109%	Achieved Y4 Target; WAEP team expects to achieve LoP in Year 5
4	Electricity Access: Number of new grid and off-grid actual direct connections (PA #3)	3,250,000	2,580,335	79%	1,625,167	1,043,136	**955,168**	92%	WAEP team expects to record connections in Y5 from previous work completed in Years 1-3
5	Average cost to utility per connection	*Reduced, 2 countries*	**0**	0%	0	1	**0**	0%	WAEP is exploring alternative strategies to gather data necessary for this indicator, as it has emerged that counterparts do not track the

No	No. Indicator	LoP	Total Results to Date	% Achieved against LoP	Y1-Y3 Actuals	Year 4 Target	Year 4 Results	% Achieved against Year 4 Target	Notes
									necessary data. Therefore, WAEP will likely be unable to conduct the required analysis to reach this target.
6	Aggregate Losses: Total technical and non-technical electricity losses/total electricity generated (PA #22)	*Reduced, at least three utilities*	2	67%	1	2	**1**	50%	WAEP is assessing data from Cape Verde to establish potential reduction in AT&C losses
7	Cost recovery	*Improved, at least two utilities*	0	0%	0	2	**0**	0%	WAEP is reviewing data from Cape Verde, Sierra Leone and Liberia to establish cost recovery
8	Utility performance (frequency of outages, duration of outages)	*Improved, 2 utilities*	1	50%	0	2	**1**	50%	WAEP is reviewing data from Côte d'Ivoire, to ascertain improvement in utility performance.
9	TWh additional cross border power trade	3.5 TWh	3.5	100%	0.5022	3	**2.99**	**100%**	LoP Target Achieved
10	Generation Capacity Pending Financial Close: Number of MW from transactions that have not yet achieved financial close (PA #6)	NA	-	-	-	1,815 MW	-	-	
11	Transactions Pending Financial Close: Number of transactions that have not yet achieved financial close (PA#7)	NA	-	-	-	29	-	-	
12	Transactions Reached Financial Close: Number of transactions that have	85	16	19%	14	24	**2**	**8%**	From RANA and Blitta projects

No	No. Indicator	LoP	Total Results to Date	% Achieved against LoP	Y1-Y3 Actuals	Year 4 Target	Year 4 Results	% Achieved against Year 4 Target	Notes
	achieved financial close (PA#9; EG.12-5)								
13	Kilometers of transmission and distribution lines reached financial close with WAEP support (PA#20)	TBD	4,239.98	-	1	0	**4,099.98**	-	Y4 results are from Desert to Power PEDECEL project - 1,340.98km RANA project-2687km PASET project- 72km
14	Amount Mobilized: Amount of investment mobilized (in USD) for energy projects by USG (PA#14; EG.7.2-1)	TBD	$5.808.5B	-	$5.517B	$4.4B	**$291.5M**	7%	Tied to MW, Kilometers of lines and connections
15	Electricity Access: Number of new grid and off-grid anticipated direct connections at financial close (PA #2)	250,000	156,864	63%	0	156,864	**156,864**	100%	
16	Average time required to get a connection	*Reduced, 3 countries*	2	67%	1	1	**1**	100%	WAEP has worked on activities leading to this result. Likely to meet LoP target in Y5
17	Cost of connection for end-users	*Reduced, 2 countries*	2	100%	1	1	**1**	100%	LoP Target Achieved
18	Regional power utility trade relationships	2	7	350%	3	1	**4**	400%	LoP Target Exceeded
19	Control area centers operationalized	5	4	80%	0	5	**4**	80%	
20	High priority regional transmission projects operationalized	6	4	67%	2	2	**2**	100%	Activities already conducted for OMVG, TRANSCO CLSG, OMVS and PIEGM will result in the achievement of the LoP target by end of Program
21	Policy Reforms: Number of laws, policies, regulations or	35	26		24	8	**2**	25%	The WAEP continues to work with counterparts to ensure

No	No. Indicator	LoP	Total Results to Date	% Achieved against LoP	Y1-Y3 Actuals	Year 4 Target	Year 4 Results	% Achieved against Year 4 Target	Notes
	standards to enhance energy sector governance formally proposed, adopted, or implemented as supported by USG assistance (PA#23; EG.7.3-1)			74%					they adopt regulatory tools, instruments, and other deliverables developed.
22	Institutions with improved tariff advocacy capacity	12	6	50%	3	6	**3**	**50%**	WAEP activities expect to yield about 5 additional institutions by end of Y5
23	Number of institutions with improved capacity to address clean energy issues as supported by USG assistance (EG. 12-2)	61	58	95%	25	25	**33**	132%	Ongoing capacity activities will enable WAEP meet LoP in Y5
24	Women in leadership roles	20	11	55%	8	5	**3**	**60%**	WAEP is continuously following up with women who have participated in previous training to assess upward mobility in their careers
25	Reports, analysis, reviews, action plans, procurement documents, tools developed, and campaigns and study tours implemented	238	240	101%	171	73	**69**	95%	LoP Target Achieved
26	Training and Capacity Building Activities: Number of people trained in technical energy fields supported by USG assistance (PA#18; EG.12-1)	1,180	1,353	115%	1004	280	**349**	**124%**	LoP Target Exceeded
27	Person hours of training	7,400	20,783	281%	15,224	1,680	**5,558.5**	331%	LoP Target Exceeded
28	National energy mix showing percent MW from clean	NA	NA	NA	NA	NA	**NA**	NA	

No	No. Indicator	LoP	Total Results to Date	% Achieved against LoP	Y1-Y3 Actuals	Year 4 Target	Year 4 Results	% Achieved against Year 4 Target	Notes
	energy technologies in each country								
29	Utilization of Risk Mitigation Tools: Utilization of risk mitigation tools by developers of Qualified Transactions supported by WAEP (PA#17)	NA	NA	NA	NA	NA	**NA**	NA	
30	U.S. exports for energy projects	NA	NA	NA	NA	NA	**NA**	NA	

APPENDIX F: YEAR 4 GENERATION PORTFOLIO ANALYSIS

Table 12 : Year 4 Generation Portfolio Analysis

Year 4 Pipeline Projects							
Project	Country	Capacity	Probability	Probability Adjusted Capacity	Qtr./Calendar Year	Technology	Variance Analysis
MCA-II Benin	Benin	50	90%	47.5	Q2/2024	Solar	Project financial close was delayed due to an unresolved $2 million funding gap.
N'Gaoundéré	Cameroon	30	70%	21	Q1/2025	Solar	The project sponsors are in discussions with ENEO regarding the Concession and Power Purchase Agreements. However, delays in receiving feedback from ENEO have caused a temporary setback for the project, resulting in a few months of delays.
Boundoukou (AMEA)	Côte d'Ivoire	50	95%	47.5	Q2/2024	Solar	Delay in starting Negotiations Agreement Concession. Concession was executed Q1 2023 . Recently FMO was appointed as Lead Arranger
Ferké (PFO)	Côte d'Ivoire	50	90%	47.5	Q4/2023	Solar	Delay in starting Negotiations Agreement Concession. 1st Semester 2023: under negotiation
Kong (EDF/Meridium)	Côte d'Ivoire	50	90%	47.5	Q4/2024	Solar	Delay in starting Negotiations Agreement Concession. 1st Semester 2023 : under negotiation
Tongon	Côte d'Ivoire	50	80%	47.5	Q1/2025	Solar	Delay in starting Negotiations Agreement Concession. 1st Semester 2023 : under negotiation
Korhogo Solaire	Côte d'Ivoire	25	80%	23.75	Q1/2025	Solar	Original project sponsor sold the project development rights to another developer. New developer to initiate Concessions negotiation during 2 Semester 2023
Moyi Power/ESSOR1	DRC	87	90%	78.3	Q4 2024	Solar/BESS	Negotiations with the DRC Government have taken longer than expected. AfDB Lead Arranger
Moanda	DRC	80	50%	40	Q2/2024	GtP	Protracted concession agreement negotiations with the Ministry of Energy and SNEL have delayed financial close.

Owendo	Gabon	120	80%	96	Q1/2024	GtP	Financial close was expected by September 2023 but was postponed due to the Coup.
Khoumagueli	Guinea	40	80%	32	TBD	Solar	Challenges of raising debt financing due to the country's political instability.
CG Cap des Biches	Senegal	86	85%	73.1	Q4/2023	GtP	The Governments of Sénégal and Mauritania are awaiting the final investment decision (FID) for phase two of the Greater Tortue Ahmeyim (GTA) project as well as the Yakaar-Teranga development this year. Yakaar-Terenga will be the primary source of gas for this project. This project financial close is dependent on the FIDs of both upstream and gas pipeline network.
Tobene	Senegal	115	80%	92	Q4/2024	GtP	The Governments of Sénégal and Mauritania are awaiting the final investment decision (FID) for phase two of the Greater Tortue Ahmeyim (GTA) project as well as the Yakaar-Teranga development this year. Yakaar-Terenga will be the primary source of gas for this project. This project financial close is dependent on the FIDs of both upstream and gas pipeline network.
Blitta Extension	Togo	20 (+4MWh BESS)	100%	20	Q2 2023	Solar	Project reached FC in November 2022, but WAEP only provided a workshop in February 2023, which AT2ER confirmed was critical in reviewing some elements in the financial model, before the project broke ground in March 2023. WAEP is awaiting attribution letter

APPENDIX G: SUCCESS STORIES

Shaping Senegal's Energy Transition Strategy

Senegal seeks to increase electricity access through renewable and cleaner energy options. Through Power Africa, the United States is providing technical assistance to help shape Senegal's Energy Transition Strategy and build a climate-smart future for all.

Picture of a NexTracker Solar Panel
Photo Credit: Power Africa

During the 2022 U.S.-African Leaders Summit, President Biden affirmed and reinforced the United States' partnership with African governments to mitigate climate change, including increased investment in Power Africa. Accordingly, Power Africa is now working with the Government of Senegal to implement an Energy Transition Strategy that builds on the country's strong position to invest in cleaner power generation and its inclusion in the G7 "Just Energy Transition Partnership".

How the Strategy Works

Senegal's Energy Transition Strategy details several decarbonization recommendations centered on the country's gas-to-power transition, including innovative approaches to utilize gas infrastructure to develop renewable energy, such as renewable gas, over the long term. The conversion of existing power plants to natural gas, alongside with the construction of new combined- cycle power plants, represents a tool for decarbonization in the short term, with the potential to reduce CO_2 emissions by about 30 percent. In addition, the strategy will facilitate the development of renewable energy projects and lower the cost of power generation in the short term while supporting carbon neutrality in the long term.

Critically, the strategy identifies more than 100 public, private, and blended options from various financing bodies that can attract the investment and financing Senegal needs to bring the strategy to life.

Next Steps for Senegal

Senegal's Minister of Energy, H.E. Aissatou Sophie Gladima, provided a preview of the strategy at the United Nations Climate Change Conference (COP27) in November 2022. She detailed how the strategy aligns with Senegal's Nationally Determined Contribution (NDC) goals of reducing GHG emissions by at least 23 percent and increasing renewable energy to 30 percent of the country's energy mix by 2030 as part of its commitment to the global climate change agenda. Further, the NDCs under the Paris Agreement outline two main goals relating to the energy transition: (1) Increasing the share of renewable energy in the national energy mix to 40 percent by 2035 by increasing renewable energy capacity, and (2) Increasing the use of natural gas to replace fuel oil and coal-fired power plants. Senegal will now incorporate its Energy Transition Strategy into its NDCs.

A group picture of key officials who participated in the DtP side event

Power Africa continues to support Senegal's energy access goals and clean energy transition. Power Africa transaction advisory and capacity-building in Senegal have resulted in nearly 470,000 new electricity connections, including more than 200,000 in the past year.

Hydropower for Greener Energy on the Gambia River

On the banks of the Gambia River where Guinea and Senegal meet, the Sambangalou cross-border power plant is set to harness the power of hydroelectric energy. Managed by the Gambia River Basin Development Organisation, (OMVG) and supported by Power Africa, Sambangalou will boast a capacity of 128 megawatts (MW) and will generate 400 gigawatt hours (GWh) per year of clean, renewable energy. More than 12,000 new households will gain access to electricity when it comes online.

Sambangalou, located just inside the Senegalese border in Kédougou, has been under development for more than 25 years and is a component of a multi-purpose project aimed at providing electricity to the four countries of the OMVG, supplying irrigation water to the farming communities in the region, and providing a source of drinking water to the residents of the area. The project complies with the African Development Bank (AfDB) Safeguards System for social and environmental protections.

Within the OMVG region, the use of wood-burning cookstoves and diesel or other heavy fuel generators is very common. New connections resulting from Sambangalou will displace the need for the use of these harmful energy sources. As such, the Sambangalou plant is expected to cut greenhouse gas emissions by more than 260,000 tons per year. This ambitious project represents part of Power Africa's efforts to support power developers, governments, and financiers to advance renewable energy infrastructure, such as hydropower, solar, and wind, hence advancing climate goals in West Africa.

To assist the plant to achieve financial close, Power Africa provided financial advisory and technical assistance to OMVG, which promotes coordination of resources to improve livelihoods within OMVGs four member countries: Senegal, the Gambia, Guinea, and Guinea-Bissau.

The Sambangalou project is a prime example of Power Africa's contribution to cleaner energy and support of a more closely linked West Africa regional power grid. The success of the project showcases the collaboration between Power Africa, its government partners, and other stakeholders. The financial close of the Sambangalou project also displays Power Africa's central role in providing support for substantial investment in Africa's energy sector and improving the economic environment of the sector. And in line with efforts to promote women's empowerment, the project also includes an agricultural program that will support product processing from local women's groups to help them develop income-generating activities.

Beyond its focus on cleaner energy, Power Africa supports the OMVG Project Management Unit (PMU) with technical assistance. Power Africa helped OMVG develop operating principles to ensure its compliance with the West Africa Power Pool (WAPP) Regional Grid Code to connect OMVG and WAPP transmission networks. Power Africa also supported the construction of 1,677 kilometers of 225 kV lines uniting the electricity grids of the four member countries.

By aligning OMVG with the larger WAPP grid code, Power Africa can achieve another of WAPP's goals: allow West African nations to integrate their national power systems into a unified, sustainable network.

Power Africa will work closely with OMVG to ensure a smooth transition from construction to operation phases.

The project is being financed by the African Development Bank, the European Investment Bank, the French Development Agency, Kreditanstalt für Wiederaufbau (KFW- the German development bank), the Islamic Development Bank, the Japan International Cooperation Agency (JICA), the Kuwait Fund for Arab Economic Development, the West African Development Bank, the World Bank, and other donors.

Reducing Upfront Costs of Connection to the Electricity Grid for Households in Togo

In Togo, connecting to the electricity grid can cost more than twice the monthly income of a family[2]. These high fees exclude many from getting their homes or businesses connected and means that around half of the country – and three-quarters in rural areas – still cannot benefit from safe, affordable, and reliable electricity[3].

In 2020, together with Power Africa, the electricity utility in Togo, *Compagnie Energie Electrique du Togo* (CEET), developed a Universal Access Program (*Programme de Branchement Universel*) that aimed to achieve full connectivity by 2030.

In 2022, Power Africa supported the Ministry of Energy of Togo in launching *Fonds Tinga,* a fund dedicated to achieving universal electricity access. *Fonds Tinga* is a revolving fund, meaning available resources at the end of a given year are reinjected in the fund to finance household connections for the following year.

Power Africa assisted the Ministry in the fund's financial modeling and provided guidance on achieving support from other development partners and financial institutions. The Power Africa team then offered management and operational guidance for the fund.

Power Africa also assisted the Ministry in moving through the universal electricity access pilot phase. In this phase, Power Africa focused on reducing upfront connection costs. Through the *Fonds Tinga* program, Togolese households are able to connect to the grid for a modest upfront cost of 1,000 FCFA (West African franc, equivalent to about $1.60), instead of the average current cost of 104,000 FCFA (about $167.00)[4]. This 100-fold decrease in upfront connection costs for end users represent a significant step in increasing access.

Roundtable Meeting with Ministry, technical and financial partners

[2] The World Bank, Adjusted net national income per capita - Togo, 2020; Ministère Délégué auprès du Président de la République Chargé de l'Energie et des Mines, 2022

[3] The World Bank, Access to electricity (% of population) – Togo, 2020; Ministère Délégué auprès du Président de la République Chargé de l'Energie et des Mines, 2022

[4] Ministère Délégué auprès du Président de la République Chargé de l'Energie et des Mines, 2022

With the introduction of *Fonds Tinga*, eligible customers will now pay the 1,000 FCFA up front to get a connection, and then gradually reimburse remaining fees to the fund over a period of a maximum of 10 years. This drastic reduction of upfront fees and possibility of long-term reimbursement should significantly accelerate connections and provide CEET with sustainable fee generation.

Fonds Tinga, along with existing efforts to extend the electricity grid and deploy off-grid solutions, should put Togo in a good position to achieve universal access to electricity by 2030. Already in the pilot phase of the universal access project, Power Africa supported Togo to achieve 38,376 connections. Power Africa anticipates the number of connections will increase significantly in the coming phase, with a target of connecting 1.2 million households to the grid by 2030. To further assist with scaling up access, the Power Africa team plans to provide technical assistance to CEET on geospatial information tools, as well as other applications to enable tracking of electrification projects. An additional component of future support will focus on equipping CEET's project coordination unit with practical, operational skills for the management of electrification projects.

Cooperating on a Connected Power System in West Africa

In West Africa, the transformational Côte d'Ivoire–Liberia–Sierra Leone–Guinea (CLSG) interconnection project, central to a dynamic and modern electric power market in West Africa, is bringing together four countries to share electricity for the benefit of over 20 million people. Through technical assistance, Power Africa is supporting CLSG's Project Management Unit (PMU) to oversee the production of affordable and cleaner energy for the region.

The History of CLSG

Liberia, Sierra Leone, and Guinea have some of the lowest electricity access rates in the world, due to high fuel costs, insufficient generation capacity, and system unreliability, among other factors. The CLSG project enables them to import electricity from Côte d'Ivoire, which has a higher electrification rate and lower-cost production than its neighbors.

CLSG is a partnership with the participating countries' utilities: LEC, EDSA of Sierra Leone, EDG, and CI-Energies of Côte d'Ivoire. In 2012, the four nations signed a treaty to establish Transco CLSG, an international company to finance, construct, operate, and maintain transmission infrastructure for CLSG.

Transco CLSG has managed the construction of a 1,303 km transmission line stretching between the four countries.

Photo credit: Transco CLSG

The CLSG transmission network now integrates one existing and 11 new substations. It has a maximum capacity of 243 MW, with the potential to be doubled by building a second circuit. Power Africa supported the signing of power purchase agreements and transmission services agreements between Transco CLSG and the four national utilities. Since 2021, to ensure successful long-term operation of the system, Power Africa provided a series of trainings, workshops, and other support activities to more than 60 staff members at Transco CLSG and the national utilities. This support covered project management, operating standards and procedures, overall business operations, the development of resettlement action plans for affected regions, and monitoring and evaluation techniques.

Moving forward, Power Africa will deliver the next phases of training to the PMU staff on these topics, as well as training on the implementation and use of a geographic information system (GIS). Power Africa is also providing ongoing infrastructure-related technical support for line construction, operation, and maintenance.

Access to Electricity

The CLSG partnership has increased power access across Liberia, Sierra Leone, and Guinea, particularly in rural areas. In regions near the transmission lines, CLSG has enabled more than 96,000 connections in more than 100 localities, providing electricity not just to homes, but also to schools, health centers, businesses, and places of worship. The project has also opened possibilities for new large-scale

electrification projects. Furthermore, the CLSG network has provided a major boost to the national transmission infrastructure in Liberia and Sierra Leone, where high-voltage lines previously did not exceed 160 kV. The project has significantly improved the reliability and stability of the national electricity systems in both countries.

Reduced Costs

By partially replacing expensive domestically generated power with cheaper power generated in Côte d'Ivoire, CLSG allows Liberia, Sierra Leone, and Guinea to supply electricity to consumers at much lower costs. Whereas the previous average cost of domestically generated power was $0.27–$0.50/kWh (depending on the locality), these three countries may eventually be able to import at a rate of $0.13/kWh. Electricity sharing has also lowered costs for importers and opened up new markets for CI-Energies in Côte d'Ivoire, creating new revenue channels and helping to improve the financial performance of all four national utilities.

Greener Power

The CLSG interconnector is also helping to mitigate climate change. Enabling cheaper power imports to Liberia, Sierra Leone, and Guinea may, in the long term, replace thermal power generators like diesel plants that are high greenhouse gas emitters.

For example, after connecting to the CLSG line, the city of Nzerekore in Guinea dismantled its 2.5 MW diesel oil power plant, reducing CO2 emissions by about 14,600 tons in 2022. In the cities of Bo and Kenema in Sierra Leone, the shutdown of a thermal power plant has reduced CO2 emissions by an estimated 52,333 tons.

Toward Further Integration

The CLSG project is part of the West Africa Power Pool (WAPP) effort to develop a regional electricity market, providing all countries in West Africa access to well-priced and reliable electricity. As an institution, WAPP is responsible for facilitating cooperation and collaboration to enable the whole region to benefit from economies of scale in power production.

Power Africa is working with WAPP to strengthening WAPP's program management and investment studies, foster the continued development of the regional market, and provide affordable, stable, reliable electricity across West Africa.

LEC Bong County Success Story

In Liberia's Bong County, a new and innovative power delivery model is lighting up homes, businesses, hospitals, and community centers. This model builds on previous activities in the region to move toward sustainable involvement of the private sector in electricity distribution system management.

In Bong County, Liberia with a population of more than 320,000, there was lack of an operational electricity grid until 2021. Power Africa supported the Liberia Electricity Company (LEC) in the construction and commissioning of a distribution grid in the county, which provided energy to thousands of residents.

In January 2022, with the support of Power Africa, Liberia Electricity Company (LEC) entered a public-private partnership (PPP) arrangement with Jungle Energy Power (JEP), a local energy firm, to operate and manage the new Bong County grid for a period of five years. This innovative partnership has led to an increase in energy access, service quality, and technical management in a rural area, and could serve as a model across the region.

Power Africa has long championed PPPs to advance energy sector development. When the Bong County grid came online, Power Africa and LEC assessed the potential for the utility to engage the private sector in operations and service delivery for the new network.

Power Africa first conducted an extensive performance assessment of supply operations in similar rural counties with grid access. This analysis enabled LEC to make informed decisions on the best approach for the effective management of the new Bong County network, culminating in a decision to use an incentive-based contract built on distribution line extensions and customer connections. On the advice of Power Africa and following an international competitive bidding process, LEC selected JEP, a company with regional network operation experience, to operate in Bong County.

JEP now provides operations, maintenance, and management services in partnership with LEC, which still maintains the medium-voltage power distribution lines.
In its short time of existence, this partnership is already bearing fruit. For example, LEC's average technical and non-technical losses prior to JEP's entry were over 60 percent overall in Liberia; whereas the losses reported from Bong County are less than 20 percent. Through streamlining operations, JEP has also supported 500 new connections, and has a target of reaching up to 5,000 over the next several months. The partnership has also contributed to a steady revenue base for LEC.

Given the success of the Bong County model, Power Africa aims to continue development of utility operation reforms using a similar model in other countries across the region. Private sector participation in this deliberate approach can enable more efficient utility operations without exposing partners to excessive financial risk. Power Africa will offer technical and commercial training to local companies, enabling local ownership and providing sustainability in power delivery.

Mapping the Future of Electricity in Côte d'Ivoire

To keep a digital eye on its fast-moving, ever-expanding electrical grid, Côte d'Ivoire relies on a modern geospatial information system (GIS) as a key enabler to its success. For the country's national utility, CI-ENERGIES, using GIS means that engineers and leadership have access to the latest information for real-time analysis, field data collection, network analysis, and a host of other grid management tasks.

Implementing GIS serves the country's long-term plan for the automation, distribution, and extension of networks across rural areas of the country in line with the country's Electricity for All Program (or *Programme Électricité Pour Tous* (PEPT). Over the next two years, PEPT aims to add approximately 400,000 new connections per year.

Until recently, CI-ENERGIES was unable to fully leverage the use of GIS technology. The utility had faced a number of challenges, including a lack of data quality, of data uniformity, and of technical capacity. In working to upgrade CI-ENERGIES' GIS capabilities, Power Africa first set out to analyze the gaps and needs for the GIS system, and then moved forward on a three-pronged approach based on its findings, to ultimately improve the country's GIS and CI-ENERGIES' ability to accomplish Côte d'Ivoire's PEPT plans. The findings indicated that CI-ENERGIES would benefit from three areas of intervention, namely: increased GIS knowledge capacity, improved data quality, and identification of additional ways to utilize GIS technology.

Improving Data Collection

Power Africa held a series of training sessions across several key areas for CI-ENERGIES staff to strengthen data collection abilities. One critical area of training centered on improved field data collection. Data collection at the location of an electrical asset (like a substation or transmission tower) increases accuracy and reliability of the overall dataset. Power Africa presented a software that CI-ENERGIES could utilize to collect and visualize high-quality data using tablet technology, instead of a paper-based system, thus ensuring a smoother connection to a systemwide grid mapping system.

Empowering CI-ENERGIES with the ability to use field-based data collection technology, such as Open Data Kit (ODK) and Qfield, will allow them to streamline field data collection processes by reducing the number of items needed to take to the field - from stacks of paper, pens, clipboards, and cameras to just a tablet. It also reduces the time it takes for new data to be entered into the databases and GIS. The company's engineers are now able to enter data into a tablet from the field to be automatically uploaded to the database and GIS. This process also increases the amount of data available from the field.

Power Africa covered other GIS topics with CI-ENERGIES such as using open-source GIS software QGIS, database management and analysis, and data collection techniques. The team completed training on POSTGIS, QGIS, and ODK, as well as training on how to prepare and use Qfield for data collection. The Power Africa and CI-ENERGIES teams also embarked on a field visit for a practical data collection exercise using ODK digitized forms and Qfield.

Using Accurate Data to Improve Analysis

CI-ENERGIES also struggled with outdated and inaccurate data, reducing its ability to manage the grid. Although CI-ENERGIES did possess a large data set that covered almost the entire existing electrical

network, this data was not complete. Incomplete and poor data quality can make it extremely difficult to perform the necessary analysis needed to update Côte d'Ivoire's master plans.

Power Africa supported CI-ENERGIES to resolve these data issues by updating the incorrect data, identifying missing information, and setting up a new streamlined and uniform data entry schema for CI-ENERGIES to follow. The newly implemented ODK and Qfield technologies alongside the updated data quality standards will improve confidence in the data collected in the field.

Increasing Electrification with GIS

By putting data quality measures in place, increasing knowledge capacity, and staying informed about new ways to leverage geospatial technology, CI-ENERGIES stands prepared to leverage its GIS technology and achieve its PEPT goals.

Data-Driving Electrification: A Digital Dashboard is Helping Senegal Achieve Universal Electricity Access Goals

Power Africa's collaboration with Senelec is creating opportunities to increase electricity access in Senegal and help the country reach its universal electricity access goal.

Power Africa technical assistance is helping our African government partners connect more homes and businesses to electricity, especially in rural and underserved areas. Through direct collaboration with energy utilities, ministries, and agencies, we are developing data-driven tools to accelerate and monitor energy access initiatives.

In Senegal, Power Africa is collaborating with the national power utility, Senelec, to create a tool to monitor electrification efforts in support of the country's universal electricity access plan (Plan d'Accès Universel à l'Electricité, or PAU). Through PAU, the Government of Senegal aims to provide all citizens with access to affordable electricity by 2025.

Senelec already had a wealth of accurate data but needed an easier way to visualize the thousands of data points related to electricity access, grid expansion, and off-grid power solutions.
Using Power BI, Power Africa and Senelec developed a bespoke, user-friendly dashboard tool to visualize electrification rates in communities nationwide, monitor and evaluate electrification projects, as well as provide Senelec engineers and leaders with up-to-date reports.

The dashboard enables Senelec to see how electrification projects within each locality are performing, identify projects that are delayed, and make data-driven informed decisions on where to expand electrification.

As part of the process, Power Africa worked with Senelec to streamline how its data are organized. Together, we structured the data into a model that enables Senelec to continue to integrate new data more easily into the database, and for the updated data to be shown as visualizations on the dashboard.

By integrating geospatial information system (GIS) technology into the dashboard, Senelec can view their thousands of electrification data points across specific locations. GIS enables Senelec to perform location-based analysis to prioritize electrification efforts in line with their universal access goals.

To set up this aspect of the dashboard, Power Africa and Senelec worked together to ensure all the necessary geospatial data was included in the dashboard's database. We created interactive GIS maps linking the geospatial data for each locality with its electrification data from the database and utilizing the Esri ArcGIS Maps for Power BI visualization tool.
After creating the dashboard, Senelec and Power Africa conducted a week-long training session for Senelec staff.

> *"The training has allowed us to understand how to maintain the dashboard in the long term and beyond, update it as needed, and develop other applications utilizing the software we learned. This dashboard is an excellent showcase for Senelec in the implementation of universal access in Senegal."- Ndèye Ami Drame, Acting Head of Distribution Planning Division, Planning Department, General Studies Directorate*

The Power of Dashboards in the Region

Across West Africa, Power Africa has helped create digital dashboards for Côte d'Ivoire's Compagnie Ivoirienne d'Electricité, Benin's Direction Générale des Ressources Energétiques, Ghana's Ministry of Energy, Senegal's Senelec, and Togo's Compagnie Energie Electrique du Togo. In the coming months, we will share more stories about how Power Africa continues to scale its work applying digital tools to drive electricity access.

APPENDIX H: SOCIAL MEDIA POSTS AND SUCCESS STORIES

Table 14: Social media and success stories published by PA

Content Title	LinkedIn	X (Twitter)	Facebook	Instagram	Medium Blog
WAEP team receives International Rescue Committee (IRC) PRO-JEUNES Award		Twitter			
Senegal Independence Day	LinkedIn		Facebook		
Cooperating on a Connected Power System in West Africa (TRANSCO CLSG)	LinkedIn	Twitter	Facebook		Medium
Togo Independence Day		Twitter	Facebook		
Girls in Information Communication and Technology (ICT) Day		Twitter	Facebook		
Empowering Girls in Science, Technology, Engineering and Mathematics (STEM) Event	LinkedIn	Twitter	Facebook		
STEM Workbook	LinkedIn	Twitter	Facebook		
GIS Training in Senegal	LinkedIn	Twitter	Facebook		
Mission to Cabo Verde		Twitter	Facebook		
WEC: Aminata Cisse, Regional Electricity Access Lead, West Africa Energy Program	LinkedIn	Twitter	Facebook	Instagram	
WEC: Linda Baaba Clarke, Shell Energy Ghana's Commercial Manager	LinkedIn	Twitter	Facebook		
USAID and Power Africa Mission to DRC		Twitter			
Shaping Senegal's Energy Transition Strategy	LinkedIn	Twitter			Medium
Reducing the Cost to Connect in Togo	LinkedIn	Twitter	Facebook		Medium
Reduction of Wholesale cost of generation in Gambia	LinkedIn	Twitter	Facebook		
Power Procurement Learning Guide	LinkedIn	Twitter	Facebook		
Universal Access to Electricity Training Program	LinkedIn	Twitter	Facebook		
International Women's Day: Feature on Ms. Mariama Mahama, Principal of the Dabokpa Technical Training Institute, Ghana,	LinkedIn	Twitter	Facebook	Instagram	
WEC: Elise Massan Akitani, Senior Energy Specialist, World Bank		Twitter	Facebook	Instagram	
West African Girls in STEM Webinar, March 2023		Twitter	Facebook		
Solar Appreciation Day: Highlight on key solar projects across West Africa	LinkedIn	Twitter	Facebook	Instagram	
WEC: Ms. Fatimata Gaba-Ouedraogo, Chief Power Engineer, AfDB		Twitter	Facebook		
Senegal's Energy Transition Strategy:	LinkedIn	Twitter	Facebook		
News Article on Power Africa and the WAEP Team's Visit to DRC to Discuss Potential Partnership		Twitter.			
Women Energy Champions (WEC) Series: Ms. Sherron Brisbane Sherman, Senior Manager, Liberia Electricity Corporation (LEC)		Twitter	Facebook		

Power Africa Coordinators Visit to Ghana: Highlights of the Power Africa Coordinator's visit to Ghana	LinkedIn,	Twitter	Facebook		
Power Africa Coordinators Visit to Ghana: Meeting with Deputy Minister of Finance		Twitter			
Power Africa Coordinators Visit to Ghana: Regional Energy Roundtable		Twitter			
Power Africa Coordinators Visit to Ghana: Meeting with Ghana Grid Company		Twitter.			
Power Africa Coordinators Visit to Ghana: Meeting with Deputy Secretary David Turk, U.S. Department of Energy		Twitter			
Power Africa Coordinators Visit to Ghana: SOE) Lunch		Twitter.			
Power Africa Coordinators Visit to Ghana: Tour of Bui Generation Station	LinkedIn	Twitter	Facebook	Instagram	
Digitization Webinar on "Digitization for Enhancing Project Management of Electrification Programs."		Twitter			

APPENDIX I: POWER AFRICA COORDINATION

The WAEP team continued to foster and facilitate coordination across Power Africa implementing partners and development partners. Meetings and updates of note in FY 2023 are described in Table 11.

Table 1: PACO Coordination Meetings and Updates, FY 2023

Interagency Partners

DFC	US Department of State	US Department of Energy	Other
			Commercial Law Development Program (CLDP): The WAEP team collaborated with CLDP to deliver training on Power Purchase Agreements (PPAs). This training was delivered to regulatory agencies in Cameroon, Congo, Gabon, Central African Republic in a bid to strengthen their capacity to better regulate the power sector. **USTDA:** The WAEP team reviewed the grant application submission to USTDA for a feasibility study grant on the Tiassalé Hydropower Project (26MW) as prepared by Bandama Energy and Finergreen, its financial advisor. The WAEP team also engaged with USTDA's West Africa Manager and her team to support the project application.

DFC	US Department of State	US Department of Energy	Other

Development Partners

Multilaterals & DFIs	Government Partners	Technical Agencies
IRENA/AfDB (DtP) Training preparation for G5 Sahel Countries on Renewable Energy integration. The goal of this training is to equip key personnel in the G5 Sahel countries, mainly utilities, regulators, policymakers, and developers with tools and best practices for integrating renewable energy into the electricity grid.		