



## 1. Project Data

<b>Project ID</b> P162580	<b>Project Name</b> Solar SOP SSA	
<b>Country</b> Western and Central Africa	<b>Practice Area(Lead)</b> Energy & Extractives	
<b>L/C/TF Number(s)</b> IDA-D3320	<b>Closing Date (Original)</b> 31-Oct-2023	<b>Total Project Cost (USD)</b> 20,051,045.48
<b>Bank Approval Date</b> 06-Jul-2018	<b>Closing Date (Actual)</b> 30-Jun-2024	
	<b>IBRD/IDA (USD)</b>	<b>Grants (USD)</b>
Original Commitment	21,000,000.00	0.00
Revised Commitment	21,000,000.00	0.00
Actual	20,051,045.48	0.00

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## 2. Project Objectives and Components

### a. Objectives

The Original Project Development Objective (PDO) was “to strengthen the regional technical capacity for preparation of large-scale solar parks and integration of solar electricity into the grids” (Financing Agreement, page 5). The PDO was phrased identically in the Project Appraisal Document (PAD) (PAD, page iv).

The Project’s PDO was not revised during implementation.



For the purposes of this Implementation Completion and Results Report (ICR) review, the PDO will be parsed into two objectives:

PDO1: To strengthen the regional technical capacity for preparation of large-scale solar parks.

PDO2: To strengthen the regional technical capacity for integration of solar electricity into the grids.

**b. Were the project objectives/key associated outcome targets revised during implementation?**

No

**c. Will a split evaluation be undertaken?**

No

**d. Components**

The Project was the first in a Series of Projects (SoPs) whose overall objective was to promote the deployment of competitively procured Regional Solar Parks in West Africa and to facilitate the integration of intermittent solar energy into the regional grid. The Project aimed to provide technical assistance (TA) to the West African Power Pool (WAPP) to support the deployment of the large-scale solar plants identified in the WAPP Master Plan. The Project focused on identifying technical bottlenecks; preparing investments in Regional Solar Parks – covering solar generation, grid infrastructure, dispatch, and storage; and strengthening planning, regulatory frameworks, technical capacity, and resource assessment and validation. The follow-up projects would invest in specific Regional Solar Parks, building on the capacity developed through the Project's TA.

**1. Original components**

**Component 1: Regional Solar Integration, Dispatch, and Capacity Building (cost at appraisal: US\$8.0 million; actual amount at closure: US\$8.8 million)** aimed to support WAPP and its member utilities in strengthening dispatch, grid integration and planning, and monitoring of variable renewable energy (VRE) through the following activities:

- **Modernization of the WAPP Information and Coordination Center (ICC):** upgrading the ICC with a dedicated platform for VRE supervision, with functions of data collection, analysis, and monitoring VRE generation volume and quality across the WAPP area. Activities would include a diagnostic assessment, procurement of equipment and software, training, and analysis of required adjustments to the ICC and WAPP coordination centers, as well as recommendations for improving VRE plants operations.
- **Creation of a WAPP Renewable Energy (RE) Task Force** in order to: (i) promote RE transition; (ii) engage regional VRE stakeholders; (iii) improve VRE-related information exchange among member utilities; (iv) share knowledge on solar integration; (v) advance energy planning tools incorporating RE. The Task Force would include the following technical working groups: (i) VRE grid integration studies and power system modelling; (ii) VRE integration energy solutions; (iii) VRE planning, procurement and operation challenges; and (iv) WAPP interconnections for VRE integration.
- **Development and implementation of a regional grid code:** drafting and submission of a regional grid code to the Regional Electricity Regulatory Authority (ERERA) for adoption and promotion among member utilities and country regulatory authorities.



- **Capacity building:** training on grid integration and dispatch, with emphasis on increasing female workforce participation.
- **Project Implementation Support:** enhancing WAPP's implementation capacity through the hiring of staff and consultants.

**Component 2: Regional Solar Parks Preparation (cost at appraisal: US\$13.0 million; actual amount at closure: US\$11.3 million)** aimed to support:

- **Identification and preparation of regional solar generation projects and associated grid investments.** Activities would cover the full range of project preparation, including:
  - grid stability studies for grid reinforcement needs and to find the optimal point of injection of electricity generated by solar parks into the grid;
  - pre-feasibility, and feasibility studies to inform the technical design of solar plants, define land acquisition needs, estimate cost of generation, and develop contractual arrangements with the off-takers;
  - safeguards instruments, including Environmental and Social Impact Assessments (ESIAs);
  - project structuring documents;
  - identification of implementation, ownership, and operational arrangements; and
  - transaction advice and document preparation for solar auctions (including power purchase agreements and bidding documents), and advice on addressing regulatory bottlenecks.
- **Implementation of solar resource ground measurement** across the region to confirm suitable sites for future solar plants and enhance knowledge of solar resources.

#### Revised Components:

The components were not revised.

#### e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

**Project Cost:** The appraisal estimate was US\$21.0 million, and the actual disbursement at closure was US\$20.1 million (Operations Portal; ICR, page ii). The difference reflects the depreciation of the SDR (loan currency) against the US dollar.

**Project Financing:** The Project was financed through an IDA grant of US\$21 million, with US\$20.1 million disbursed at closure.

**Borrower/Recipient (WAPP's) contribution:** No contribution was planned or provided.

**Project Dates:** The Project was approved on June 21, 2018, and became effective on December 17, 2018. The mid-term review (MTR) was completed on March 20, 2022. The Project was restructured twice: (i) on November 1, 2023; and (ii) on May 29, 2024. The original closing date of October 31, 2023, was extended once, by eight months, and the Project closed on June 30, 2024.

#### Restructurings:



**Restructuring 1 (November 1, 2023)** extended the Project closing date by eight months, from October 31, 2023, to June 30, 2024, due to instability following the coups in Niger and in Mali, which delayed field activities.

**Restructuring 2 (May 29, 2024)** involved only the reallocation of funds across categories.

**Split evaluation.** A split evaluation was not applied, as there was no reduction in Project scope or ambition.

### 3. Relevance of Objectives

#### Rationale

**Country and Sector Context.** At Project appraisal, the World Bank had developed a strong partnership with WAPP, with investments in transmission projects identified in the ECOWAS Master Plan and technical advisory for regulations, project preparation, and capacity building. WAPP was established in 1999 by ECOWAS to integrate electricity grids across 14 countries, improve reliability, and reduce costs. After the WAPP Secretariat was formally established in 2006, it began developing a unified regional electricity market and launching the construction of major regional transmission lines. West Africa has significant RE potential, particularly for solar, and the decline in solar equipment and battery storage prices have made solar increasingly competitive. While the regional power integration was expected to facilitate more VRE, including solar, by balancing supply and demand across the region, WAPP had limited experience with VRE and needed technical support. Private sector investments in solar projects were essential but depended on an improved investment climate, including structured procurement processes, financial risk mitigation strategies for utilities (off-takers in most cases), and strong regulatory and policy frameworks. The Project's support for Regional Solar Parks aimed to: (i) increase national electricity production to meet regional demand; (ii) significantly reduce average electricity costs; and (iii) promote solar power exports through regional interconnections. The Project was the first phase of a multi-phase multi-country program with planned follow up investment projects aiming to develop solar parks in Burkina Faso, Mali, the Gambia, and Senegal River Basin (spanning parts of Guinea, Mali, Mauritania, and Senegal) (ICR, pages 1-3, 33)

**Relevance to the Recipient's Strategies at closure.** WAPP is a specialized institution of ECOWAS with the mission to develop power generation and transmission infrastructure and coordinate power exchange among member states. The Project was aligned with WAPP's strategy outlined in the ECOWAS Master Plan 2019-2033, specifically its objective to achieve the optimal integration of RE in West Africa, while considering economic, environmental, and technical constraints. (ICR, page 1)

**Relevance to the WBG's Assistance Strategies at closure.** The Project's PDO remained aligned with the WBG's Country Partnership Frameworks (CPFs) for the Project's direct beneficiary countries – Burkina Faso, The Gambia, Mali, and Niger - that were active at Project closure. Specifically:

- The Burkina Faso CPF FY2018-23, *Focus Area 1: Accelerate Sustainable Private Sector Led-Growth for Job Creation, Objective 1.2: Improve Energy Access* emphasized support to a shift of the energy mix to solar power and reduced fuel subsidies. It also highlighted support to rural RE development through a new Bank project focused on off-grid RE and hybrid systems, and mini-grids; and a solar park feasibility study.



- The Gambia CPF FY2022-26, *Focus Area 2: Enable Inclusive and Resilient Private Sector Driven Job Creation, Objective 2.1. Increase Access to Sustainable Energy and Clean Water* supported increased electricity access through on-grid and off-grid solutions and continued efforts to strengthen the national utility's capacity to integrate and dispatch VRE.
- The Mali CPF FY2016-19 (the latest one), *Focus Area 2: Create Economic Opportunities, Objective 2.3 Improve Infrastructure and Connectivity* aimed to expand rural access to electricity through RE. The PDO was also aligned with Mali's 2022 Systematic Country Diagnostic, *Pathway III: Private Sector Development for Job Creation, Objective: Enhance Access to Electricity*, which called for support to RE generation and mini-grids in rural areas.
- The Niger CPF FY2018-22, *Focus Area I: Increased Rural Productivity and Incomes, Objective 2: Improved Availability of Productive Infrastructure for Trade in Rural Areas* aimed to increase electricity access through new solar mini-grids, while the analytic program included a Solar Independent Power Producers (IPP) Development Study.

**Previous sector experience.** The Project drew on lessons from previous World Bank operations supporting VRE development. These included findings from several studies that evaluated the impact of high levels of VRE penetration on network stability in the Region, including in Senegal, Burkina Faso, and Niger. Past projects have demonstrated that facilitating private sector participation is essential for ensuring fiscal sustainability and technical quality in large-scale solar development. Relevant examples include the WBG - supported *Argentina Renewable Fund Guarantee* project (P159901), *Shared Infrastructure for Solar Parks Project* (P154283), and *Zambia Scaling Solar* (IFC 37811)/*Zambia Scaling Solar Energy Guarantee Project* (P157943). *Zambia's Scaling Solar Program* also benefited from ground-based solar measurements and a comprehensive site identification process.

The Project aligned with the WBG CPFs for client countries, as well as the ECOWAS objectives and WAPP's priorities, building on prior WBG analytical and operational support for VRE development. Accordingly, the relevance of objectives is rated High.

## Rating

High

## 4. Achievement of Objectives (Efficacy)

### OBJECTIVE 1

#### Objective

To strengthen the regional technical capacity for preparation of large-scale solar parks.

#### Rationale

The Theory of Change (ToC) was not prepared for the PAD but was developed for the ICR. The ICR's ToC outlined the Project's activities/outputs, intermediate outcomes, PDO outcomes, and long-term impact, with clear links from one level of the results chain to the next. To achieve Objective 1, the Project supported the



identification and preparation of large-scale solar projects by conducting grid-stability assessments, pre-feasibility and feasibility studies, preparing safeguard instruments, and providing transaction advice on auctions and auction documentation. Expected intermediate outcomes included: (i) utilities of member countries learning to conduct competitive bidding and develop solar park tenders; (ii) member countries developing solar parks with private participation; and (iii) solar projects generating positive returns and reducing power supply costs. Expected PDO outcomes were: (i) strengthened capacity and expertise of WAPP and member utilities in preparing regional solar parks; and (ii) accelerated solar park preparation. The long-term impact was increased regional solar generation capacity and dispatch, and greater public and private capital mobilization for solar parks. The ToC also identified critical assumptions: (i) implementation of the ECOWAS Master Plan for the Development of Regional Power Generation and Transmission Infrastructure 2019-33; (ii) continued mobilization of public and private finance for ECOWAS energy infrastructure; and (iii) sustained dialogue among key stakeholders on transmission and distribution management.

The ToC provided a clear and comprehensive representation of the Project's logic, with well-defined causal links and assumptions, supported by a concise description of the results chain.

The RF for Objective 1 was generally aligned with the PDO and ToC, but only partially covered the expected results. It included one PDO indicator - generation capacity of large solar projects prepared for implementation, an appropriate intermediate outcome for a TA project – and two output level IRIs: (i) the number of solar sites measured, and (ii) incorporation of safeguards assessments into project design.

However, the RF had shortcomings. The PDO indicator was vaguely defined, with no clarification in the PAD on how “projects prepared” would be measured, thus requiring support from IRIs. In fact, one of the main conclusions of the MTR was that “the milestone(s) constituting a “developed project” need to be better defined (MTR Aide-Memoire, page 2)”. At the same time, the RF's coverage of Objective 1 outputs by IRIs was limited: although the PAD listed numerous activities under Objective 1 (see section 2.d), only two outputs – solar resource measurement and safeguards application - were tracked. Several key outputs that would have more fully underpinned the PDO indicator were omitted, including grid stability, pre-feasibility, and feasibility studies; project structuring documents; implementation, ownership, and operational arrangements; and solar auction transaction advice and documents.

#### **IRI results:**

1. “Solar ground measurement campaign undertaken in the region (number of sites measured)” (baseline: zero, target: 25 sites). The achievement was 33 sites; the target was exceeded.
2. “Feedback from safeguards-related consultations with affected populations, including with vulnerable groups and women, documented, disclosed and taken into account in project design (Yes/No). The target was achieved.

#### **PDO results:**

1. “Generation capacity of large-scale solar projects that were identified and prepared (Megawatt (MW))” and “Renewable energy capacity enabled (MW)” (core indicator) (baseline: zero, target: 500 MW (PAD, page 25)). The achievement at closure was 1,200 MW. The target was significantly exceeded. The ICR noted that this was due to higher-than-expected demand (ICR, page 8)



**Overall**, the Project supported the preparation of Regional Solar Parks through technical, economic, feasibility, environmental, and geotechnical studies, as well as solar capacity measurement and transaction advisory. To support site measurement, 28 automatic solar meteorological stations (SMA) were installed and functioned for two years, collecting data. Transaction advisory included legal due diligence for each site; advice on contracts and auctions; drafting key documents such as a concession agreement, and electricity transmission and purchase contracts; and organizing consultations with private sector and the government on solar auction. Notwithstanding the absence of RF indicators for the purpose, a large number of feasibility studies (technical, economic and financial) were completed, along with environmental and geotechnical studies, all of which underpinned the preparation of solar park projects in the four ECOWAS member states mentioned below. By Project closure, the preparation had been completed for solar park projects in Burkina Faso (300 MW), The Gambia (150 MW), Mali (300 MW), and the pilot hybridization project of the Manantali hydropower plant (300 MW), while it was not yet finalized for the Niger plant (150 MW). Based on these results, several follow-up Bank projects were already under preparation, specifically: Burkina Faso Solar Energy and Access Project (P166785), Regional Solar Park of The Gambia (P504421), Mali Electricity System Reinforcement and Access Expansion Project (P176633), and West Africa Regional Electricity Market Program (WA-REMP, P505173). In Niger, discussions on the solar park implementation were still underway at the time this Review was finalized. WA-REMP continued the Project's activities, as recommended by the MTR, by supporting the operationalization of the ICC, synchronization efforts, country-level grid codes, advancement of the regional electricity market, and fulfillment of such prerequisites for country projects as the launch of tenders for Regional Solar Parks. Urgent preparation of the country projects was essential to ensure that the Project's TA outcomes remain relevant at the start of their implementation. (ICR, pages 8-11, 24, 27, 33; MTR, pages 6, 12).

However, Restructuring Paper 1 (October 2023) and the ICR noted that a few activities - such as transaction advisory services to Niger – had been cancelled earlier, as they were no longer feasible due to the security situation, and the funds were reallocated to capacity building (Restructuring Paper, page 4; ICR, page 6). This indicates that not all expected outputs were achieved. At IEG's request, the team provided a confirmation that transaction advisory for the Niger's solar park auctions was cancelled due to the time required for site selection, and because the services could not be completed within the duration of the Grant Agreement. Training under the feasibility study in Niger and a cross-country forum on energy exchanges were also cancelled due to the instability. In addition, the RF provided limited evidence on the achievement of Objective 1 due to a vague PDO indicator and insufficient output monitoring to compensate for it.

**Rating.** The Project achieved or exceeded the Objective 1 PDO indicator and IRI targets and significantly contributed to the preparation of Regional Solar Parks. Moreover, follow-up projects were already under preparation by Project closure. However, some activities were cancelled, and there is insufficient evidence to confirm that all planned activities were accomplished, due to limited RF coverage of outputs and a vaguely defined PDO indicator. Accordingly, the Objective 1 efficacy rating is Substantial.

**Rating**  
Substantial

## **OBJECTIVE 2**

### **Objective**

To strengthen the regional technical capacity for integration of solar electricity into the grids.



## **Rationale**

The Theory of Change (ToC) was not included in the PAD but was presented in the ICR. It outlined the Project's activities/outputs, intermediate outcomes, PDO outcomes, and long-term impact, with clear links from one results chain level to the next. To achieve Objective 2, the Project supported regional solar integration, dispatch, and capacity building. Key activities included equipping the ICC center with an RE post, preparing safeguards consultation reports, revising and adopting the regional grid code, and training and certification WAPP staff in VRE integration. Expected intermediate outcomes included: (i) improved capacity of WAPP and member countries to plan and integrate VRE; (ii) improved knowledge on competitive bidding and solar park tender development; (iii) development of solar parks with private sector participation; and (iv) solar projects' positive returns on investments and reduced power costs. Expected PDO outcomes were strengthened capacity for solar power integration, including developed regional regulatory and policy frameworks and VRE certification. (See the long-term impacts and critical assumptions under Objective 1.

The ToC clearly and comprehensively represented the Project's logic, with causal links from activities to outcomes and key assumptions in place, supported by a concise description of the results chain.

The RF for Objective 2 was generally aligned with the PDO and ToC but provided incomplete coverage of expected results. It included two PDO indicators (one with a gender-specific sub-indicator) and two IRIs. The PDO indicators measured: revision and adoption of the regional grid code by WAPP, and WAPP and utility staff training and certification in VRE integration - an intermediate outcome indicator (an appropriate level for a TA project) and an output level indicator, respectively. The two IRIs tracked: RE capacity enabled, and the ICC center equipped with an RE post.

The main shortcoming of the RF was its limited coverage of Objective 2 results. Although the PAD listed numerous activities under Objective 2 (see section 2.d), only two – grid code development and training – were monitored. Other results were omitted, such as ICC upgrading (including diagnostics, provision of equipment and software, and analysis of ICC-WAPP coordination and of VRE plant operations) and on the establishment of the RE Task Force with four working groups. In addition, the inclusion of the indicator "RE capacity enabled" as an Objective 2 IRI is confusing, as it measures the same result as the Objective 1 PDO indicator.

### **IRI results:**

1. "ICC center equipped with renewable energy post (Yes/No)". The target was reached.

### **PDO results:**

1. "Regional grid code revised and adopted by WAPP (Yes/No)". The target was achieved. The WAPP Network Code was developed and adopted by the WAPP Executive Board. It was then submitted to the ECOWAS Regional Electricity Sector Regulatory Authority (ERERA) for approval. (ICR, page 12)

2. "Staff of WAPP and member utilities trained and certified in VRE integration with a minimum 15 percent women (Number)" (baseline: zero, target: 100 staff). The achievement at closure was 114 staff; the target was reached. The gender specific sub-target (share of women) was exceeded.

**Overall**, the Project strengthened regional capacity to integrate solar power into the grid through the development and implementation of the regional grid code, ICC upgrades, establishment of the WAPP RE



Task Force, and staff training. The grid code covered connection, operation, electricity market, metering, operator training, and planning, thus supporting the harmonization of technical rules needed for cross-border interconnections, energy transfers, electricity market transactions, updates to national grid codes, and improvements in environmental protection and energy efficiency. The ICC upgrades included deployment of a VRE platform to accurately calculate actual and forecasted VRE generation in the WAPP area, thereby improving system operations. The RE Task Force was set up, and methodological guidelines on VRE integration, evaluation of integration solutions, and management of high-VRE networks were developed. Training - with an emphasis on gender equity – covered preparation and implementation of solar projects, operation and integration of solar production, maintenance of solar systems, creation of a trainer pool, study tours, and creation and operationalization of the West Africa National Committee of the International Council of Large Electricity Networks (CIGRE), with 16 study committee experts. While the RF did not fully capture all expected Objective 2 results, the ICR provided sufficient supplementary evidence to assess achievement. (ICR, pages 13-14, 24, 27)

**Rating.** The Project fully achieved Objective 2, strengthening the regional technical capacity for VRE integration by developing the grid code, upgrading the ICC, setting up a RE Task Force, and training. Accordingly, the efficacy rating is High.

**Rating**  
High

## **OVERALL EFFICACY**

### **Rationale**

Overall, efficacy is rated as High. The Project made a substantial contribution to enhancing regional capacity to prepare solar parks projects and was highly successful in supporting VRE integration through a comprehensive set of TA activities. Under Objective 1, the PDO indicators were exceeded. Although some planned activities were dropped and the RF provides limited evidence on outputs, the ICR offers sufficient non-RF information to demonstrate that the results were strong.

### **Overall Efficacy Rating**

High

## **5. Efficiency**

### **a. Economic Analysis:**

No economic analysis was conducted at appraisal or closure, as the Project focused on technical assistance, and such analysis was deemed not applicable. The ICR assessed efficiency based solely on administrative performance, while noting that large solar projects with storage can generate significant economic benefits



including: (i) increased on-grid electricity access; (ii) reduced GHG emissions and fossil fuel use; (iii) lower electricity costs; (iv) improved solar integration; and (v) greater private capital mobilization and private sector participation in solar development (ICR, page 15)

**b. Administrative Efficiency:**

The ICR noted that the Project was implemented efficiently and within the budget. Strong preparation drew on region and international lessons, including studies on VRE impact on network stability in Senegal, Burkina Faso, and Niger; private sector engagement in Argentina, India and Zambia; and the use of high-quality data for project identification in Zambia. Key risks - such as low off-taker creditworthiness, limited competition in contract awards, weak solar development capacity, and coordination challenges between WAPP and national utilities - were mitigated through structured bidding, de-risking, capacity building, and selecting viable WAPP-prioritized projects. Implementation benefited from commitment of the WAPP Secretariat and member utilities, and efficient institutional arrangements: oversight by the WAPP Secretariat, execution by WAPP staff supported by international consultants, and a PIU embedded in the Secretariat. The PDO was clear, the design well-structured and simple, and M&E arrangements adequate. Project preparation benefited from close collaboration among the World Bank, WAPP Secretariat, and member utilities. (ICR, pages 15-20)

However, the Project experienced an eight-month delay due to both external and internal challenges. External factors included insecurity from military coups in Burkina Faso and Niger, attempted coups in Mali and The Gambia, COVID-19, and exchange rate volatility. Internal challenges included financial management (FM) and procurement delays – such as late recruitment of an accountant, technical difficulties with the Systematic Tracking of Exchanges in Procurement (STEP) platform, and slow WB IT support. Assigning environmental and social (E&S) specialists to countries was also delayed. WAPP’s statutory limitations constrained country ownership and hindered key activities, including adoption of long-term generation plans and securing sites and land rights. The slow transition from regional project preparation to country-level implementation created the risk of studies becoming outdated, which could have been mitigated by aligning study completion with tender launches. (ICR, page 15, 19-20)

On balance, considering the strong Project preparation, WAPP and member utility commitment, effective stakeholder collaboration, and clear design – while also accounting for delays, FM and procurement challenges, and limited country ownership - the efficiency rating is assessed as Substantial.

**Efficiency Rating**

Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal		0	0 <input type="checkbox"/> Not Applicable
ICR Estimate		0	0 <input type="checkbox"/> Not Applicable



\* Refers to percent of total project cost for which ERR/FRR was calculated.

## 6. Outcome

The Project aligns with ECOWAS objectives, WAPP priorities, and the WBG country strategy, and builds on earlier WBG support for VRE development. Efficacy analysis indicates strong performance in achieving the PDO through a broad set of TA activities, with all RF indicator targets met. Although some activities under Objective 1 were cancelled, and RF evidence is insufficient to verify completion of all planned outputs, the ICR provides non-RF information demonstrating that the results were strong. Efficiency analysis shows strong preparation, a clear design, and solid counterpart commitment, but also highlights delays, FM and procurement challenges, and limited country ownership.

Relevance of objectives and efficacy are rated as High, while efficiency is Substantial. As such, overall outcome is rated as Highly Satisfactory.

### a. Outcome Rating

Highly Satisfactory

## 7. Risk to Development Outcome

**Political.** The Project was affected by political instability – military coups or attempted coups – in all four beneficiary countries. The region continues to face conflict and instability, while peace and security remain prerequisites for sustainable development and the functionality of built infrastructure. Despite this challenging context, the Project remained effective and efficient. The follow-up solar parks investment projects were designed to account for this risk, selecting contexts and locations to minimize potential losses and inefficiencies. This approach could be replicated in future operations.

**Ownership and commitment.** This risk arises from the withdrawal of Mali, Burkina Faso and Niger from ECOWAS in September 2023, to join the Alliance of Sahel States, a three-member security and economic block established through a mutual defense pact. This shift creates uncertainty regarding the commitment of the Alliance countries to WAPP's RE agenda. However, the goals of the Alliance are both political and economic and include developing energy infrastructure and supporting overall economic growth. As noted in the ICR, these countries remain committed to developing clean and affordable power and continue to engage in regional solar park and energy market projects, particularly those promoted and funded by the WBG. Moreover, the development of the WAPP regional power market - aimed at increased access to low-cost electricity – remains most feasible through RE deployment. (ICR, page 21)

**Financial stress and private sector mobilization.** The financial situation of national power utilities was identified as a risk at appraisal, as their financial distress and reliance on budget transfers or sovereign guarantees could limit private sector participation in solar park projects. Under the Project, this risk was mitigated through a structured bidding process. While this risk remains, the PAD suggested that subsequent investments in solar parks can use de-risking instruments such as IDA Partial Risk Guarantees, as well as



rely on potential Bank operations to improve utility financial viability (PAD, page 18). Additionally, declining solar technology costs continue to enhance the investment potential of solar projects.

**Technical.** As noted in the PAD, this risk relates to limited local experience and capacity in solar energy development. These technologies are relatively new to the region, and local expertise in implementing, managing, and maintaining solar plants remains limited, creating a risk to further solar project development and maintenance of the constructed solar parks. Upgraded and modernized infrastructure for electricity dispatch and transmission also requires specialized skills to operate both the hardware and software. The PAD emphasized that capacity building and knowledge sharing through the Renewable Energy Task Force working groups, supported under the Project, would be key to mitigating this risk in subsequent investments operations. (PAD, page 18)

## 8. Assessment of Bank Performance

### a. Quality-at-Entry

The Project design was clear, simple, and well structured, drawing on lessons learned from VRE studies and Bank investments in similar RE projects globally and in the Region. Risks were thoroughly assessed, with mitigation measures incorporated into Project design (see details in section 5). The preparation included stakeholder dialogue and adequate M&E arrangements. The institutional arrangements were robust, with an oversight by the WAPP Secretariat, execution by WAPP staff supported by international consultants, and a PIU within the Secretariat. Preparation was supported by strong government commitment.

However, there were some shortcomings. The RF had a measurement gap: despite numerous activities included, RF coverage of expected outputs was limited (see section 5), and the Objective 1 PDO indicator – which monitored projects prepared for implementation - was vaguely defined, with no clarification in the PAD on how “projects prepared” would be measured. (ICR, pages 15, 19-20)

### Quality-at-Entry Rating

Satisfactory

### b. Quality of supervision

The ICR noted that the Bank team provided consistent implementation support, conducting an average of two supervision missions per year, and filing 11 Implementation Status and Results Reports (ISRs). A Mid-Term Review (MTR) was conducted during March 7-10, 2022. Implementation benefited from commitment and close Bank cooperation with the WAPP Secretariat and member utilities, efficient institutional arrangements, and competitively hired consultants, resulting in high quality studies. The Bank team maintained engagement throughout implementation despite insecurity - military coups or attempted coups in all four beneficiary countries – and adapted efficiently during the COVID-19 pandemic through virtual missions and communications.



However, some shortcomings are noted, including fiduciary issues caused by the late recruitment of an accountant and challenges with the STEP platform, compounded by late WB IT support. Hiring E&S specialists for country-level support proved difficult. Country ownership was hindered due to WAPP's statutory limitations, affecting activities such as adopting long-term generation plans and securing sites and land rights. While competitive selection of IPPs was mostly implemented as planned, the Sanankoroba Solar Park in Mali was an exception where it could not be applied. (ICR, pages 15, 20)

Overall, the Bank performance is rated as Satisfactory. Both design and implementation were strong, although each had some shortcomings.

### **Quality of Supervision Rating**

Satisfactory

### **Overall Bank Performance Rating**

Satisfactory

## **9. M&E Design, Implementation, & Utilization**

### **a. M&E Design**

The RF at design was generally aligned with the PDO and ToC, with time-bound, specific, objective, and Project-attributable indicators that were mostly quantitative. However, the RF provided limited coverage of activities/expected results. While the PAD listed numerous activities in component description, only some of them were monitored through the IRIs. The PDO indicator for Objective 1 - generation capacity of large solar projects prepared for implementation - was vaguely defined, with no clarification in the PAD regarding the measurement of "project prepared". This shortcoming was noted in the MTR conclusions (MTR Aide Memoire, page 2). Although IRIs could have compensated for this weakness, they only partially captured expected outputs and thus did not provide sufficient supplementary evidence (see section 4 for details). For Objective 2, the PDO indicators were well defined, but the IRIs again provided limited coverage of expected results.

The ICR found the M&E arrangements were generally adequate but noted that effective monitoring was initially hampered by the absence of an M&E focal point, which made data collection challenging (ICR, page 18).

### **b. M&E Implementation**

According to the ICR analysis, M&E implementation was adequate and carried out as planned, with regular reporting through 11 ISRs, Aide Memoires, and an MTR, with analysis and conclusions comprehensively reflected in the corresponding Aide Memoire. These documents informed management decisions and guiding implementation and adjustments as needed. No changes were made to the RF during implementation. (ICR, pages 13-14)



### c. M&E Utilization

The ICR reported that M&E was effectively utilized by the PIU for data reporting, and by the Bank team in Aide Memoires and ISRs. Data was shared with stakeholders, including the Country Management Unit. The Bank team used the information to track progress toward the PDO, flag emerging issues, adjust implementation plans, inform decision-making, support the ongoing dialogue with key stakeholders, and guide Project restructurings. (ICR, page 18)

The quality of M&E is rated Substantial. Despite shortcomings in the RF design, both M&E implementation and utilization were adequate. The RF's limited coverage of expected results was mitigated by capturing relevant information outside the RF.

### M&E Quality Rating

Substantial

## 10. Other Issues

### a. Safeguards

**Environmental and Social (E&S) Safeguards.** Although the Project primarily focused on technical assistance and was not expected to have direct E&S impacts, its inclusion of pre-feasibility and feasibility studies for potential solar plants and transmission infrastructure led to its classification as Category A (Full Assessment) at appraisal. The following policies were triggered: (i) OP/BP 4.01 (Environmental Assessment); (ii) OP/BP 4.04 (Natural Habitats); (iii) OP/BP 4.11 (Physical Cultural Resources); (iv) OP/BP 4.12 (Involuntary Resettlement); and (v) OP/BP 4.37 (Safety of Dams). An Environmental and Social Framework (ESMF) and a Resettlement Policy Framework (RPF) were developed and disclosed prior to Project approval. Subsequently, 16 ESIA's and 12 RAP were prepared, to be updated and submitted for clearance under country solar park investment projects. In the last six implementation periods (June 2021 to June 2024), E&S performance was rated Satisfactory for Environmental Assessment, Natural Habitats, Physical Cultural Resources, and Involuntary Resettlement, while Safety of Dams declined from Satisfactory to Moderately Satisfactory in June 2024. (PAD, page 22; ICR, pages 18-19)

### b. Fiduciary Compliance

**Financial management (FM).** The ICR noted that FM performance was generally adequate but faced challenges that caused implementation delays, notably the slow recruitment of an accountant, which initially negatively affected FM performance. Over time, FM performance improved; however, the lack of reliable disbursement forecasts persisted. The final audit of the financial statements - dated April 30, 2025 - received an unqualified opinion and was reviewed and accepted by the World Bank (source: Project



team). FM performance was rated Moderately Satisfactory in the last six implementation periods (June 2021 to June 2024). (ICR, page 19)

**Procurement.** The ICR noted that procurement performance was generally adequate, supported by a senior procurement consultant on the Project team. Nonetheless, delays occurred due to the late recruitment of an accountant and technical difficulties with the STEP platform, compounded by slow WB IT support. To address these issues and accelerate processes, the Bank team organized procurement training sessions. Procurement performance was rated Satisfactory in the last six implementation periods (June 2021 to June 2024). (ICR, page 19)

**c. Unintended impacts (Positive or Negative)**

The ICR noted no unintended outcomes and impacts resulting from the Project.

**d. Other**

The Project design emphasized gender inclusion in training activities, and the intended results were exceeded. Building on this experience, new RE projects are incorporating gender equality, including through a Gender Action Plan (e.g., *Western and Central Africa: WAPP Ghana-Cote d'Ivoire Interconnection Project* (P178923)). (ICR, page 16)

**11. Ratings**

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Highly Satisfactory	Highly Satisfactory	
Bank Performance	Satisfactory	Satisfactory	
Quality of M&E	Substantial	Substantial	
Quality of ICR	---	Substantial	

**12. Lessons**

The following lessons were derived from the ICR (ICR, pages 21-22):

**1. Clear and simple project design, combined with implementation by a trusted, committed, and experienced agency, strongly supports PDO achievement.** The Project design was simple, with two components and a clear, detailed list of activities linked to the PDO. Implementation was entrusted to the WAPP Secretariat - an institution experienced in supervising World Bank projects, with adequate capacity, strong understanding of local realities, and close collaboration with national



electricity utilities. These factors were critical for the Project's successful implementation and achievement of outcomes.

**2. Successful achievement of TA results is more likely in a stand-alone TA project than through TA activities in an investment operation.** The Project benefited from being a stand-alone TA operation, which contributed to stronger results and impact. When TA activities are part of an investment project, priority is typically given to physical investments, while TA receives less attention and is often delayed to later stages of implementation, when financial resources and time are limited. In such cases, TA is frequently canceled or moved to follow-on operations. This Project illustrates the advantages of a stand-alone TA design in delivering strong outcomes and effectively preparing future investment projects.

**3. Expanding WBG cooperation with regional integration organizations, such as ECOWAS and WAPP, enhances the sustainability of project outcomes and supports long-term objectives and transformative impact.** The WBG and ECOWAS/WAPP share aligned development goals and pursue global and regional priorities. Regional integration organizations have a strong understanding of regional challenges and opportunities and the capacity to facilitate multilateral dialogue, which enhances the effectiveness of Bank projects. The Project significantly benefited from WAPP's competencies and its platform for engaging member countries at the sectoral level – an approach that proved more efficient than engaging with individual countries. Prioritizing cooperation with regional development organizations would likewise benefit future WBG operations in the Regions.

### 13. Assessment Recommended?

No

### 14. Comments on Quality of ICR

The ICR provides detailed and technical information on several key aspects of Project implementation, including restructurings, relevance of objectives, efficacy, risks to development outcome, and E&S safeguards compliance. It is internally consistent, and the lessons learned are based on the ICR discussion and useful for similar projects.

However, some sections - particularly those on administrative efficiency, factors influencing Project performance, M&E quality, and fiduciary issues - would have benefited from more comprehensive fact sharing and analysis and, in some cases, more clarity.

On balance, as the ICR provides overall sufficient and technically sound information, the rating is Substantial, despite the noted shortcomings.

#### a. Quality of ICR Rating



Substantial