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R3	24/06/2024	FINAL	Stéphane N'zi	Guy Bombo	WAPP SPEC
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## LIST OF ABBREVIATIONS

Abbreviation	Definitions
<b>TSO</b>	Transmission System Operator
<b>PPA</b>	Power Purchase Agreement
<b>REA</b>	Relative European Agreement
<b>ERERA</b>	ECOWAS Regional Electricity Regulatory Authority
<b>BMS</b>	Battery Management System
<b>ECOWAS</b>	Economic Community of West African States
<b>ECREEE</b>	ECOWAS Centre for Renewable Energy and Energy Efficiency
<b>ESF</b>	Environmental and Social Framework
<b>ESS</b>	Environmental and Social Study
<b>CEDAW</b>	Convention on the Elimination of All Forms of Discrimination against Women
<b>ESMF</b>	Environmental and Social Management Framework
<b>HVAC</b>	Heating, ventilation and air conditioning system
<b>DOD</b>	Depth of Discharge
<b>WAPP</b>	West African Energy Pool
<b>ESIA</b>	Environmental and Social Impact Assessment
<b>SEA</b>	Sexual Exploitation and Abuse
<b>ESSS</b>	Environment, Social, Health, Safety
<b>E&amp;S</b>	Environment & Social
<b>SH</b>	Sexual harassment
<b>LFP</b>	Lithium Fer Phosphate
<b>MW</b>	Megawatt
<b>MWh</b>	Megawatt hour



<b>NES</b>	Environmental and Social Standard
<b>NMC</b>	Nickel Manganese Cobalt
<b>NON</b>	No-Objection Notice
<b>SDG</b>	Sustainable Development Goal
<b>ESCP</b>	Environmental and Social Commitment Plan
<b>ESP</b>	Environmental and Social Management Plan
<b>WMP</b>	Workforce Management Plan
<b>HHSEP</b>	Hygiene, Health, Safety and Environment Plan
<b>SEP</b>	Stakeholder Engagement Plan
<b>BESS</b>	Battery Energy Storage System
<b>CHS</b>	Charging status
<b>PMU</b>	Project Management Unit
<b>ToR</b>	Terms of Reference
<b>GBV</b>	Gender-Based Violation
<b>WAPP</b>	Western African Power Pool
<b>WP3</b>	Work Package 3
<b>LCMC</b>	Local Coordination and Monitoring Committee
<b>CMM</b>	Complaint Management Mechanism
<b>SEBC</b>	Specialist of the Control Office
<b>SDSG</b>	Social Development and Gender Specialist
<b>SSE</b>	Environmental Safeguard Specialist
<b>ESMP</b>	Environmental and Social Management Plan
<b>ECC</b>	Environmental Compliance Certificate
<b>RAP</b>	Resettlement Action Plan
<b>SMP</b>	Stakeholder Mobilization Plan
<b>WMP</b>	Workforce Management Plan



## 1. Executive Summary

This document is the regional environmental framework developed by WAPP in collaboration with ERERA and ECREEE with the ECOWAS mainland country members within the framework of the implementation of the Battery Energy Storage System (BESS) Project to support the West Africa interconnected power grid.

This environmental framework aims to identify appropriate regional and national institutions of the region and legislations to create an enabling environment for the successful implementation of the BESS project while protecting the rights and interests of stakeholders.

In addition, this framework also provides the BESS policies, standards and guidelines applying the safeguards relevant to the investment, which could have impacts on the biophysical and social environments in which this investment will be made.

The methodological approach of this framework is essentially based on the review of official documents of ECOWAS, each of the member countries and potential donors.

### Description of the BESS project

The BESS is a regional project whose objective is to provide, among other things, services related to energy storage through batteries. These services are necessary for frequency regulation, voltage control, time-shifting of energy, reduction of congestion on transmission networks, Black Start capability, and to minimize the negative impacts of variable renewable energy sources on the network while increasing their integration and benefiting from their potential positive impacts.

### Potential positive impacts:

The positive impacts are notable in terms of employment, labour recruitment and business opportunities for small and medium-sized enterprises, local economic development through small scale trade and the creation of small-scale income generating activities, improved exchanges of electricity in the interconnected WAPP grid, increased access to electrical energy for economic development in the West African sub-region through the availability and reliability of electricity, the potential to reduce CO<sub>2</sub> and greenhouse gas (GHG) emissions and the impact on climate change resulting from grid synchronization.

### Potential Negative Impacts:

Impacts on the soil in terms of physical disturbance and contamination by solid or liquid waste, (geotechnical studies), impacts on air quality with the production of dust and exhaust gases, the



risks of noise emissions, vibrations and odours affecting the living environment of local communities, the impact on surface waters by contaminants such as solid or liquid waste, the risks of insufficient communication with the communities, the risks of traffic accidents during travel, the increase in traffic due to the consultants' vehicles and machinery, the risks of work accidents linked to a wrong manoeuvre (handling, falling objects, etc.), the risks of opposition to the temporary occupation of the estates due to study investigations, the risks related to health and safety at work, the risks of safety and security in relation to free movement within countries, the risks of renewed conflicts and grievances, the risks of an influx of non-native individuals in search of employment, the non-respect of habits and customs in the localities, the risks of weakening social structures, the risks of erroneous clarification of environmental and social impacts, the risks of political instability leading to social unrest that may lead to the conduct of activities, etc.

### Mitigation and enhancement measures

Appropriate measures have been proposed and developed as part this document to help avoid, prevent, mitigate and compensate for potential risks and negative impacts, and measures to enhance and maximize positive impacts. These are generally recommended measures to be taken to ensure that the contents of the preparedness studies have considered the management of risks and impacts. They are proposed in the form of generic measures, which are measures that can be applied in several phases of the project and are easily implemented, and specific measures envisaged according to the specificity of the risks and impacts. The latter are often drawn up in the form of plans, the implementation of which requires a specific organisation for managing these impacts.

The Environmental and Social Management Plan (ESMP) is therefore developed under this assignment to bring together all the recommended measures by distinguishing the monitoring and follow-up programs as well as the capacity building programs necessary for the effective implementation of the ESMP. Emphasis was placed on the development, adoption, and implementation of the Stakeholder Engagement Plan (SEP) and the Complaints Management Mechanism (CMM) planned for the preparation, execution and operation phases with the objectives, target groups, as well as suggested communication methods.





## Institutional, legislative, and regulatory framework

This regulatory framework would provide institutions and stakeholders with guidelines for the implementation of the project, and a capacity-building plan was proposed with a suggested training programme. This provision ensures the effective and efficient implementation of the ESMP



## 2. Introduction

### 2.1. Background and rationale for the project

The expansion of renewable energy generation seen globally has been one of the energy sector's biggest success stories over the past decade. However, it poses the challenge of maintaining efficient, cost-effective, and high-performing electricity grids by properly integrating intermittent renewable energy sources, such as solar and wind power. This situation makes it necessary to use all sources of flexibility.

The use of grid storage is not new, like pumped hydro, but in recent years, BESS has emerged as a key source of flexibility to integrate renewable energy generation.

BESS can play a role in any market, including wholesale and balancing markets, and provide a wide range of services to transmission and distribution systems to ensure efficient, stable and reliable system operation.

The life cycle of the BESS can be divided into the following few main phases: manufacturing, transportation, installation, operation, maintenance, dismantling, recycling and/or disposal.

It is assumed that the production of battery cells, modules and power electronics will not take place in the short term in the West African region. If deemed relevant, the study could address aspects related to raw materials and mining that are relevant to both batteries and the West African context.

Given that many BESS projects are already operational worldwide, the procedures and framework for safety and environmental protection are increasingly well-established. This study proposes the various steps used in drafting the environmental and social framework, while relying on the existing regulatory context and best practices in the countries where these BESS projects are already deployed. A key element to consider is the risk of fire. This is true for any electrical installation, but even more so for battery storage, as some battery chemistry poses a risk of thermal runaway (a chemical chain reaction makes the fire very difficult to extinguish). Some documents highlight the fact that LFP (lithium iron phosphate) batteries are increasingly replacing NMC (nickel manganese cobalt) batteries and are inherently safer. The regulatory framework needs to consider the fact that battery technology is still evolving. Recycling and disposal of batteries is a less mature topic as the global volume of end-of-life batteries is still very low and does not allow for economies of scale to make recycling profitable. The main aspects to consider when discussing recycling are:



- The need to promote a "recyclable by design" approach, i.e. ideally selecting technologies and suppliers that offer batteries that are easy to recycle. This is a challenge because it often conflicts with the goal of lower cost.
- What is the value of the raw material that makes up the battery. For example, LFP battery materials are cheaper and more abundant, so recycling these batteries is less attractive than recycling NMC batteries.
- Recycling location: If recycling cannot be done in the region, the environmental impact and cost of transporting the batteries to the recycling facilities must be considered.

The potential use of second-life batteries could also be considered. A large part of the production of battery cells today is destined for the electric vehicle production line. When these batteries have lost their capacity and can no longer be used in a vehicle, they retain sufficient capacity to be used as stationary storage. Since 2022, several initiatives have existed to recondition the battery of electric vehicles for second life use as part of the BESS project. Due to the lack of economies of scale (see above), they do not yet provide cost savings compared to the new BESS, but this could be a promising solution for the future.

The following tasks are proposed:

- a) Description of the current environmental and social regulatory framework in the region
- b) Analysis of international regulations in countries with existing BESS projects and analysis of the guidelines of international funding agencies.
- c) Define a harmonized environmental and social regulatory framework that considers the characteristics of the receiving environment as well as installation and operating activities with a view to ensuring environmental and social management in accordance with the national legislation in force and the requirements of technical and financial partners.

First draft of the proposed regulatory framework for validation by the project stakeholder, followed by final report and input to training material.

## 2.2. Objective of the study

The objective of this assignment of the consultancy is to propose an environmental regulatory framework for the development of BESS in the West Africa.



### 2.3. Aspect Genre

The energy sector, like other STEM (science, technology, engineering and mathematics) fields, is affected by a persistent problem: it employs too few women, especially in leadership positions. Over the years of implementing development cooperation projects, the Consultant has started to work on the intersection of gender, energy and sustainable development, and to advance gender equality and women's empowerment in the energy sector of developing countries in Africa and Asia.

Specifically, the development of more efficient and environmentally friendly BESSs requires innovative solutions that would be easier to achieve with greater participation from a diverse and inclusive talent pool. The Consultant will first review the ECOWAS Guidelines on Gender as well as other international guidelines on gender mainstreaming in the energy sector, in order to build foundational knowledge that will serve as a basis to facilitate the following studies:

- Mapping of gender roles, responsibilities, challenges and capacities along the BESS value chain
- Gender-sensitive stakeholder analysis for the BESS sector, including identification of gendered impacts.
- BESS Situational Analysis of the Female Workforce for Each ECOWAS Country and Recommendations
- Gender-Responsive Communication Toolkit and Guidelines in Deliverables and Trainings

In collaboration with GIZ and WAPP, the Consultant will complement Gender Equality and Social Inclusion Mainstreaming (GESI) processes to empower women and disadvantaged groups through BESS technology and governance structures. For example, establishing gender-responsive policies at the community and national levels, supported by evidence, such as sex-disaggregated data and analysis, to support ministries and public departments in developing gender-responsive programs, monitoring systems, and data collection methods. In addition, to foster training, training programmes will be developed, reflecting the social reality of women and supported by digital means, as described in more detail in the next section.



### 3. Methodology for the Development of the Environmental and Social Framework of the BESS

The methodological approach to developing the environmental and social framework of the Battery Energy Storage System (BESS) involved stages of Documentary Research related to the BESS system.

This phase was preceded by a kickoff meeting for the BESS project on December 12, 2022, after which it was agreed to provide a travel and site visit plan by the consultant for data collection in various ECOWAS countries.

Subsequently, on February 27, 2023, an introduction letter of the consultant was addressed to the ministry in charge of energy, public utilities, and TSOs by WAPP, requesting the availability of data and documents related to the electrical transmission networks and the regulatory and legislative framework governing the energy sector and electricity market, including the consultant's visit schedule in these countries.

Following this data collection mission by the consultant, the majority of the data, documents, and information were gathered from network managers, electricity producers, regulatory authorities, but very few from the Ministries of Environment and Gender, which were not yet fully involved or mobilized. These elements were included in a data collection report prepared by the consultant and presented during a workshop from June 19 to 21, 2023, in Sally, Senegal.

During the workshop in Accra, Ghana, from November 20 to 23, a due diligence study on the regulatory and institutional framework presented a comparative analysis of energy storage systems. This documentation helped to understand the various types of energy storage legislations and the technology that supports them.

Internationally, there are several business models that depend on how ownership and operational responsibility are distributed among public utilities or network operators, consumers, and BESS providers.

**Centralized Systems:** The deployment of BESS as standalone facilities can be developed and operated by private operators. This alternative is named "centralized system" in the Terms of Reference (TORs) for this consultation. Legal frameworks define who can own BESS. Different alternatives include the deployment of BESS by:



- Private operators: private BESS operators can be based on a free market or a public tender; or
- Public operators: Transmission or distribution network operators. This option is not permitted by some legal frameworks, for example in the European Union, the UK, or Germany. However, it is permitted in California.

### 3.1. Data Collection on Political, Legislative, and Regulatory Acts Related to the BESS in ECOWAS

Data was collected from member companies and member ministries of the WAPP through office and field visits in the 14 ECOWAS member countries on the following work modules:

- Work Package 1: Develop a least-cost investment plan for the deployment of BESS to support the implementation of the ECOWAS Master Plan.
- Work Package 2: Development of a regulatory and institutional framework for large-scale deployment of BESS in ECOWAS (taking into account the WAPP network code).
- Work Package 3: Development of a regional environmental framework for large-scale deployment of BESS in ECOWAS.

Direct data collection with member companies and ministries of the environment was initiated but did not prosper. It was deemed necessary to designate a focal person at the ministry in charge of the environment. Thus, the meeting in Saly, Senegal, from June 19 to 21, 2023, resolved that the data and contact details of the focal person for the Ministry of the Environment must be ensured by the focal points of the ministry in charge of energy and supported by the public utilities. This arrangement belatedly allowed the gathering of information and data on the environmental and social policies, strategies, legislations, and regulations in force in most ECOWAS countries, specifically during their presence at the workshop in November 2023 in Accra, Ghana.

### 3.2. Workshop for Validation of the Environmental and Social Framework

The processing of the information and data collected, combined with the results of the documentary research, allowed for the development of a draft environmental and social framework on Battery Energy Storage Systems.

The draft framework was submitted for adoption at the validation workshop of the environmental and social framework on May 16 and 17, 2024, at the SARA KAWA Hotel in Lomé, Togo.



## 4. Overview of Battery Energy Storage Systems

### 4.1. Storage Systems

Electrical energy storage systems include mechanical, chemical, electrical, thermal, and electrochemical systems.

The selection of a specific storage solution is therefore always the result of a technical-economic-financial and socio-environmental optimization requiring the following main characteristics to be considered:

- Energy performance,
- Possible power range,
- Achievable energy range (autonomy or storage time),
- Response time to network loads (active and reactive power),
- Overall efficiency (%) of the charge and discharge cycle,
- Self-discharge rate (loss of energy storage as a function of time),
- Lifespan,
- Duration of use (limitation of the number of charge and discharge cycles),
- Economic performance and financial management,
- Cost per kWh,
- Investment costs (investment and operation),
- Cost – efficiency (a battery with a slightly lower energy density may be more cost-effective)
- Complexity of the facilities (qualification of personnel, training of personnel),
- Environmental and social performance,
- Site constraints (specificity of the site, space required, ambient conditions, etc.),
- Energy density (amount of energy stored per unit of volume or mass),
- Local and global social and environmental impact,
- Risks to the safety of staff and the public.

The electrochemical battery storage system was chosen as the preferred solution to satisfy strategic needs.

**Solid-state battery systems** : Solid-state batteries include lithium ion, lead-acid, etc. Lithium ion is widely used in electrical energy storage systems. According to current estimates, about 85%



of installed electrochemical systems use lithium batteries. Lithium ion involves a wide range of chemical formulas in which lithium ions are transferred between electrodes during charge and discharge reactions. The construction or composition of lithium batteries varies from manufacturer to manufacturer. Lithium ion has the smallest installation footprint compared to technologies with similar energy capacity.

**Lithium-ion battery** : First of all, it is important to know that there is no such thing as a "one" Lithium battery. Instead, there are a variety of different energy storage systems in which lithium is used in its pure state or in bound form. Specifically, a distinction is made between primary (non-rechargeable) and secondary (rechargeable) lithium-ion cells. In common usage, the latter are usually referred to when talking about lithium-ion batteries, or better yet, lithium-ion accumulators.

- Lithium Battery Thermal Management: A Crucial Challenge for Performance and Sustainability

The thermal management of lithium batteries is an essential aspect to consider when designing and using these energy storage systems

- The Crucial Impact of Temperature on Lithium Batteries

Temperature has a significant impact on the performance and durability of lithium batteries. Extreme temperature conditions, whether too high or too low, can lead to significant malfunctions. Batteries are particularly affected when the batteries operate outside their optimal operating range: -20°C to 55°C.

When batteries are exposed to high temperatures, it can lead to increased degradation of internal materials, reducing storage capacity, overall battery life but also increasing safety risks, as they can lead to chemical leaks, short circuits, or even fires. On the other hand, temperatures that are too low can cause an increase in the internal resistance of the battery, reducing its charging and discharging power.

- Thermal management by liquid cooling

Liquid cooling thermal management involves the use of coolant that circulates inside aluminum heat exchangers in direct contact with the cells. The glycol water injected into the heat exchangers is kept at an optimal temperature thanks to an internal air conditioning system. Liquid thermal management is widely used in high-performance, long-range electric vehicles. It provides better thermal stability and helps extend battery life, which is essential to ensure optimal performance and long-term reliability.

- Thermal management by convective exchange or passive exchange





Convective exchange thermal management consists of using the ambient air circulating around the cells and the inertia of the battery (with a preference for the use of materials with high thermal conductivity in the battery to increase heat exchange). Moving air accelerates heat exchange by taking away the accumulated heat and replacing it with fresh air. This air circulation helps maintain a stable and optimal temperature. A major advantage of convective exchange thermal management is its simplicity and efficiency.

## 4.2. World Bank-funded Feasibility study

BESS Installation Project is an ambitious initiative that aims to improve grid management and stability in ECOWAS countries. The technical relevance of installing storage systems via grid simulations, with and without BESS was confirmed in an interim report of a feasibility study done in July 2021 with the World Bank funding. And the simulations have shown that the interconnected grid will be stable in the face of contingencies (sudden loss of a generator or a critical HV line) in particular, thanks to future interconnections between the different countries. In addition, the study highlighted that BESS, in particular Li-ion technology (either LFP or NMC) can be an important asset to ensure better frequency regulation, particularly in a context where intermittent renewable energies are growing in the energy mix.

## 4.3. Battery Life Cycle

The life cycle of lithium-ion batteries can vary greatly depending on their build quality, the type of device, and the frequency of use. On average, the lifespan of a lithium-ion battery is about 8 years. And LFP technology has a longer life cycle and it's a little safer whereas NMC batteries take up a little less space and have lower self-discharge.

### 4.3.1. Transport of Batteries

Lithium batteries are classified under UN numbers 3090/3091 (lithium-metal batteries) and UN 3480/3481 (lithium-ion batteries) as Class 9 dangerous goods. This means that lithium-ion batteries are subject to dangerous goods regulations during transport, and specific requirements must be met for transport packaging.

#### General rule:

- Use UN-approved transport packaging for transporting lithium-ion batteries by road, rail, ship, or air;



- Depending on the condition of the lithium-ion batteries, the transport box must also have appropriate approval and meet certain packaging instructions according to the ADR (European Agreement concerning the International Carriage of Dangerous Goods by Road).
- In accordance with regulations, the following are used:
  - Fire-retardant products (PyroBubbles granules) as filling material in crates, acting as an extinguishing agent because they are tested according to the EN3-7 standard for solid and liquid combustible materials.
  - Expanded glass granules that are poured into the crate or introduced as filler cushions.
  - Fire-retardant absorbent material made of textured fiberglass.

#### **4.3.2. Installation and Operation of Batteries**

Battery storage systems will be containerized. Operation and maintenance of the batteries will primarily be managed remotely via teleoperation and remote control.

Battery containers should include the following features:

- A Battery Management System (BMS)
- All associated measurement and control systems
- Protection against battery overcurrents
- Fire detection and protection systems
- Heating, ventilation, and air conditioning (HVAC) system
- Reference environmental conditions: operating temperature from 0°C to +45°C, relative humidity from 0% to 95%, non-condensing.

The Battery Management System automatically controls the charging and discharging of individual cells/modules, balancing the cells/modules to optimize energy consumption and autonomy, monitoring the condition of the cells/modules, and providing critical backups to protect the batteries from damage. The BMS will monitor battery system parameters such as the voltage and current of the string, SOC, cumulative number of cycles, and DOD.

The main operating modes envisioned for the ECOWAS case are as follows:



- **Manual Mode:** The SSE operator must be able to provide the power setpoint of the grid to the Energy Management System (EMS) controller via the Human-Machine Interface (HMI) of the SSE's SCADA.
- **VAR Support Mode:** The SSE must provide VAR support to the grid for voltage regulation.
- **Frequency Regulation:** The SSE must be able to support the grid when the grid frequency is very low or very high by supplying or absorbing power from/to the grid.

#### 4.4. End-of-life battery management.

Batteries are considered to reach the end of their lifespan when their energy capacity degrades to the point where it is about 80% of their original energy capacity. In the case of preventive maintenance to maintain the initial capacity of the batteries, the service life of the batteries shall equal the service life specified in the technical specifications.

There are a few battery management options for operators or owners of storage batteries:

**Reuse:** The end of battery life does not mean that the battery is unusable. It has at least 80% of its original energy capacity left, allowing applications to continue to be delivered to the grid as planned during the normal life of the battery. However, the application will be served with less energy capacity.

**Second life:** Batteries can be dismantled and moved for use in other applications. They can be used for applications that require less energy on the grid, or they can be sold to industries, businesses or individuals wishing to stabilize their power supply and ensure a good quality of supply for a local network, at a lower cost than the purchase of new equipment. This resale price of the facility must be negotiated on a case-by-case basis but may justify a positive end-of-life cash flow for the storage facility owner.

**Recycling :** The storage and transport of used and end-of-life lithium-ion batteries, including lithium-ion batteries, must be subject to various international and national regulations aimed at minimising risks to human health, infrastructure and the environment. The points below are provided as an indication of the main international rules and common best practices. Other requirements may apply, depending on national legislation or standards and procedures required by other parties such as insurance companies and shipping agencies:

Used batteries are prohibited from air transport unless authorized by the State of origin and the State of destination (CRR 2019).



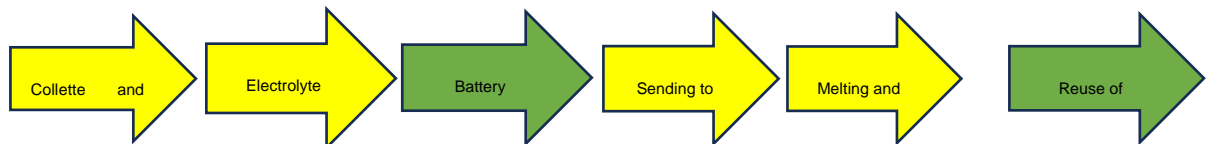
For transport, end-of-life batteries must be packed in an insulating, leak-resistant, stabilizing, and/or impact-resistant system. The chosen packaging solution must comply with the safety requirements of ADR, which must be confirmed by an accredited certification body (Reneos 2022).

Small lithium-ion batteries are typically packed in UN-approved drums, embedded in sand or vermiculite. Sand or vermiculite separates the batteries, prevents movement and shock, and absorbs heat from overheated cells. Valves facilitate the evacuation of overpressure.

Damaged batteries weighing more than 30 kg must be packed separately. Transport containers, as well as carriers, must be labelled with the appropriate class of dangerous goods (REAcodes No. 9) and the UN code (UN3480 Lithium Batteries for Recycling).

Cross-border transport must, in many cases, follow the Basel Convention's prior informed consent procedure, whereby the competent authorities (usually the environmental authority) of the exporting country notify the competent authorities of the transit country and the destination country prior to movement. Consignments of used batteries for reuse or conversion can only be exempted from this rule if they are accompanied by a third-party functional test.

Diagram of the battery recycling chain with the potential impact of each step on the environment



Recycling phase	Destination of materials	Potential Impacts
Collette and transportation	Used batteries are collected and transported to recycling facilities	The potential impact here lies in the safe handling and transportation of batteries, as they may contain hazardous materials
Electrolyte withdrawal	The electrolyte (chemical liquid) is removed from the batteries	The potential impact lies in the safe management of the electrolyte, which can be corrosive and toxic
Battery fragmentation	Batteries are fragmented into different elements (cathodes, anodes, etc.)	The potential impact here is the need to manage solid waste generated during fragmentation
Sending to the foundry	The fragmented parts of the battery are sent to the foundry	The potential impact lies in the management of potential emissions during the merger
Melting and refining	Fusion allows metals contained in batteries to be recovered	The potential impact is linked to gas emissions and energy consumption during fusion
Reuse of materials	Recovered metals are used to make new products	The potential impact lies in managing residual waste and reducing demand for new raw materials

**Figure 1: Battery recycling chain with the potential impact of each step on the environment**



**Decommissioning/Dismantling:** This is an important step that must be carried out carefully and in accordance with environmental and safety regulations. Here are the general steps involved in the dismantling process:

- **Assessment and Planning:**

Before dismantling begins, a full assessment of the BESS is required.

Identify components, cables, batteries, and other elements of the system.

Develop a detailed plan for dismantling, taking into account potential risks and safety measures.

- **System Shutdown:**

Turn off the power supply to the BESS.

Make sure that all connections are secure and that the system is powered off.

- **Removing the Batteries:**

Batteries are the main components of the BESS. Remove them carefully.

Follow proper procedures to safely disconnect batteries.

- **Disassembling Components:**

Disassemble other system components, such as inverters, transformers, and cables.

Label each component for easy tracking.

- **Waste Management:**

Batteries and other components of the BESS may contain hazardous materials.

Be sure to dispose of them in accordance with local hazardous waste management regulations.

- **Waste treatment:**

This treatment refers to recycling whose objective is to recover the materials used in the manufacture of lithium-ion batteries, particularly waste. The most important phases involved are:

1. **Stabilization:** The battery pack is discharged through a resistor or a saline solution (for example, an aqueous solution of  $\text{Na}_3\text{PO}_4$ ). This step aims to reduce the electrical and thermal risks associated with batteries at the end of their life.

2. **Pretreatment:** The battery pack is dismantled to isolate the different modules. These modules can then be dismantled to recover the positive electrodes and extract the active material. Alternatively, they can be crushed and shredded under an inert atmosphere. After grinding, a black mass containing hydrophobic carbon and hydrophilic metal oxides is obtained. And,



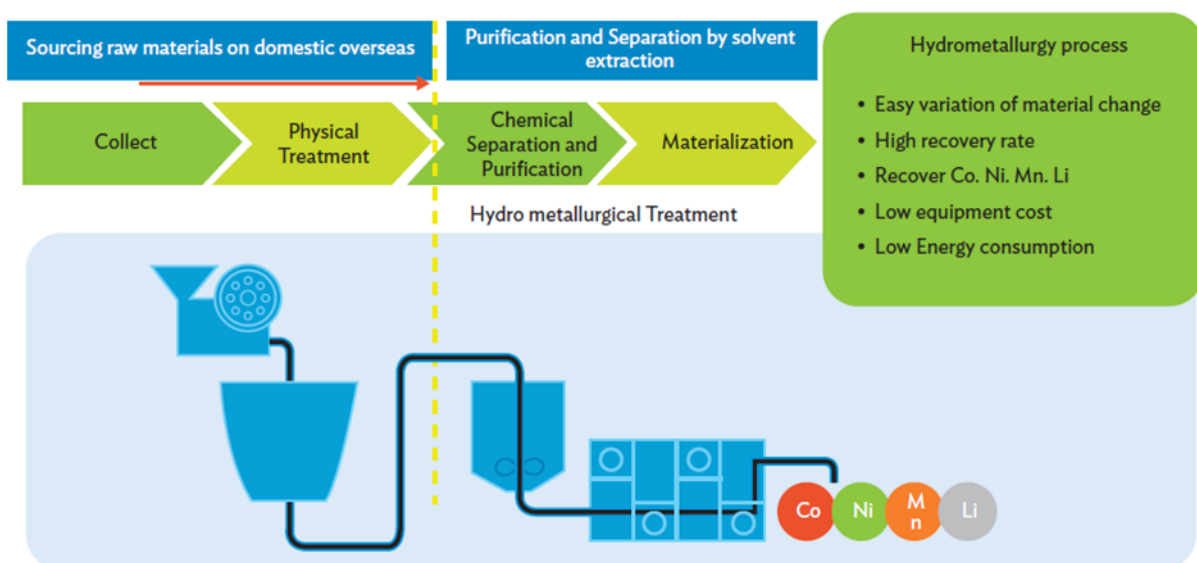
3. **Hydrometallurgy:** Metals are dissolved by leaching at elevated temperatures, then isolated by liquid/liquid extraction or precipitation.

- **Recycling Process:**

The recycling process begins by using a gas-fired thermal oxidizer to remove combustible materials, like plastic insulation, from the waste. The gases produced are then cleaned in the plant's scrubber to eliminate pollutants. This leaves behind clean cells that contain valuable metals. These cells are chopped into small pieces and heated until the metals melt. Non-metallic substances burn away, forming a black slag that is removed. The different metal alloys, based on their weight, separate and are collected from the top, similar to skimming cream from milk.

Li-ion batteries are typically recycled through a method called pyrolysis, which primarily recovers the metal content. Other types of batteries, such as zinc-carbon and alkaline-manganese, may be recycled using different thermal-metallurgical methods, like smelting, to recover metals, especially zinc.

The recycling process also involves a stage called hydrometallurgical processing, which follows physical pre-treatment like crushing and shredding. This process dissolves the materials from spent lithium-ion batteries and selectively separates the metals from the solution, which is then purified to extract valuable metals. Most recycling plants use a combination of hydrometallurgical and mechanical processes to achieve this.



Co = cobalt, Li = lithium, Mn = manganese, Ni = nickel.

**Figure 2 : Lithium-Ion Battery Recycling Process**



Source: Korea Battery Industry Association 2017 “Energy storage system technology and business model.

- **Security Audit:**

Before leaving the site, verify that all components have been properly removed and that the site is secure.

- **Documentation:**

Document all stages of decommissioning, including photographs and reports.

Save this information for future reference.

In summary, dismantling a BESS requires a methodical approach, attention to detail, and regulatory compliance. It is essential to work with qualified professionals to ensure a safe and efficient process.

## 4.5. Local Content – Value Chain and Waste Treatment of Li-ion Batteries

### 4.5.1. Value Chain of Li-ion Batteries

- 1) **Manufacturing and Assembly:** Local production facilities could be established for the manufacturing of battery components and the assembly of batteries. This includes the production of cathodes, anodes, and electrolytes, as well as the assembly of these components into complete batteries. Investment in local manufacturing can create jobs and build local expertise.
- 2) **Collection and Sorting:** Establishing local collection points for used Li-ion batteries ensures they are efficiently gathered without ending up in landfill. Proper sorting mechanisms need to be implemented to differentiate Li-ion batteries from other types of batteries and electronic waste.
- 3) **Recycling and Recovery:** Developing facilities that specialize in the hydrometallurgical and pyrometallurgical processes necessary for the recycling of Li-ion batteries can help recover valuable metals such as lithium, cobalt, and nickel. This promotes a circular economy and reduces the demand for virgin materials.
- 4) **Secondary Market:** Refurbished batteries and extracted metals can be sold in secondary markets. Batteries that retain sufficient capacity can be repurposed for less demanding applications like energy storage systems, while recovered metals can be supplied back to battery manufacturers.



#### 4.5.2. Waste Treatment of Li-ion Batteries

- 1) **Safe Handling and Transportation:** Proper training must be provided for handling and transporting used Li-ion batteries to prevent accidents, considering their hazardous nature.
- 2) **Advanced Recycling Technologies:** Investment in advanced technologies for the safe and efficient recycling of Li-ion batteries is crucial. Techniques like direct recycling, which preserves more of the battery's value, should be explored.
- 3) **Environmental Compliance:** Facilities must adhere to strict environmental standards to minimize the impact of battery recycling on the environment. This includes the treatment of emissions and effluents resulting from recycling processes.

#### 4.5.3. Recommendations to Regional and National Authorities

- 1) **Policy Framework:** Develop a comprehensive policy framework that supports the recycling of Li-ion batteries and the establishment of a local value chain. This includes incentives for businesses to invest in battery recycling technologies and facilities.
- 2) **Subsidies and Incentives:** Implement subsidies and tax incentives for companies investing in the local battery recycling industry. Financial incentives can also be offered to consumers for returning their used batteries.
- 3) **Research and Development Support:** Encourage research into new and improved methods of battery recycling and recovery by providing grants and funding to universities and research institutions.
- 4) **Public Awareness Campaigns:** Launch educational campaigns to raise awareness about the importance of proper disposal and recycling of Li-ion batteries. This can increase participation rates in recycling programs.

**Regulatory Standards:** Establish and enforce strict regulations on the collection, handling, and recycling of Li-ion batteries to ensure environmental safety and worker health.

By focusing on developing a robust local value chain and implementing stringent waste treatment protocols, regional and national authorities can significantly enhance the sustainability and efficiency of Li-ion battery recycling within their jurisdictions.





## 4.6. Battery Safety & Security

Energy storage systems, especially battery energy storage systems (BESS), present a range of hazards that make the technical safety of large-scale systems a challenge. However, this case of electrochemical energy storage, its grid-scale use is relatively new and safety issues are still being analyzed.

With a growing need for energy storage in application markets, such as reliability and capacity building, the pace of energy storage system deployments for grid applications is accelerating, and these BESS deployments to be connected to the transmission power grid can now reach gigawatt-hour capacities.

It is important to note that electrochemical systems with well-established manufacturing and quality control systems have very low failure rates, well below one in a million, but a large number of cells will likely be used in grid-scale energy storage systems and may therefore increase the safety risks of these facilities.

For large-scale energy storage with thousands of individual cells arranged in packs and modules, there is a risk of a failure event from one cell to multiple cells and possibly to the entire system.

This is especially problematic for cells connected in parallel to allow for greater power transfers. If a failure of a single cell generates large amounts of heat, thermal propagation of the failure is also possible. In this way, a single point of failure can lead to a series of cascading failures throughout the system.

In recent years, the capacity and energy density of battery-related products for large-scale energy storage have increased at a remarkable rate. Serious incidents have occurred with large Li-ion BESS connected to the grid, raising public safety concerns. In most cases, these types of incidents occur when thermal runaway occurs in a battery cell and spreads to surrounding batteries. The inherent properties of Li-ion cells make it extremely difficult to avoid thermal runaway in a single cell.

Therefore, interrupting the propagation of thermal runaway to surrounding cells and modules is extremely important for the safety of large-scale BESS.

## 4.7. Ensuring Safety – Codes and Standards

Codes and standards are used to determine the minimum risk mitigation requirements for a system. There is a hierarchical network of standards that impose requirements on the design of



energy storage systems at each level of integration. Component standards such as UL 1741 on Li-ion batteries or CSA C22.2 No. 340 on battery management systems have checklists of testable and verifiable measurements that must be met in order to be listed. Embedded system standards like UL 9540 then impose requirements on how components are connected to each other in a system.

Installation standards such as NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, then specify where and how energy storage systems can be installed safely. The IEEE has standards that cover the installation of specific battery chemicals (e.g., IEEE 484 for vented lead-acid) and how to handle electrolyte spills (IEEE 1578), which together cover most of the hazards associated with aqueous batteries. Finally, built environment standards, such as the International Fire Code (IFC), provide general requirements for all buildings. Although these are imperfect categories, in that individual standards often cover multiple aspects of the system, they illustrate that requirements for a specific facility can be found in a wide range of applicable standards.

#### 4.8. Mining in Africa

Africa is seeing a surge in lithium mining projects, with several countries signing contracts and initiating projects to exploit this valuable resource:

1. Democratic Republic of Congo (DRC): The DRC hosts significant lithium projects like the Manono Lithium Project, developed by AVZ Minerals. This project is one of the world's largest lithium-rich pegmatite deposits and is expected to be a major contributor to the lithium supply chain (FurtherAfrica) (Energy Capital & Power).
2. Zimbabwe: Zimbabwe is actively increasing its stake in the global lithium market. The Arcadia Lithium Project, near Harare, is one of the largest hard rock lithium resources globally. The government has even banned the export of raw lithium to foster local processing and add value (Global Witness) (dw).
3. Mali: The Goulamina Lithium Project, a joint venture between Leo Lithium and Jiangxi Ganfeng Lithium, is anticipated to produce significant amounts of lithium over its 21-year lifespan. Mali's Bougouni Lithium Project is another major initiative, promising to diversify the Malian economy currently dependent on gold (Ventures Africa) (Energy Capital & Power).



4. Ghana: Ghana's Ewoyaa Lithium Project, developed by Atlantic Lithium, is expected to be a key player in West Africa's lithium production, promising economic diversification and significant production capabilities (Ventures Africa) (MyJoyOnline).

These projects are part of a broader trend where African nations are looking to leverage their natural resources to jump onto the global stage as critical suppliers in the lithium market, crucial for electric vehicles and energy storage solutions. These developments highlight both the potential economic benefits and the challenges related to environmental and social governance that accompany such large-scale extractive industries.



## 5. Development of the current environmental and social regulatory framework in ECOWAS and standards applicable to the project

All ECOWAS member countries already have legislative and regulatory frameworks in place for environmental management in several sectors of development activity. At a time when it is a question of promoting the energy storage system, it is important to develop an environmental regulatory framework.

### 5.1. Institutional Framework for Environmental Management and Assessment

The institutional framework of the project includes institutions at the regional, national and local levels.

#### 5.1.1. At the regional level

- **Economic Community of West African States (ECOWAS)**

The Economic Community of West African States (ECOWAS) was established on 28 May 1975 by the Treaty of Lagos, with the objective of "promoting cooperation and integration with a view to economic union in West Africa with a view to raising the standard of living of its peoples, maintaining and increasing economic stability, to strengthen relations among Member States and contribute to the progress and development of the African continent". ECOWAS, through WAPP, promotes and develops infrastructure for the production and transmission of electricity in partnership with the national systems of member countries with a view to establishing the regional electricity market. The ECOWAS Master Plan for the Means of Electricity Production and Transmission approved by the Heads of State and Government, the latest of which is the ECOWAS Master Plan for the Development of Regional Means of Production and Transmission of Electrical Energy 2019-2033 adopted by the ECOWAS Heads of State and Government in December 2018 through the Additional Act A/SA.4/12/18.

Various institutions established by ECOWAS have been involved in advancing of the West African Electricity Sector; WAPP has been involved in power exchange coordination among member states, ERERA has been involved in the regulation of the cross-border trade of the regional electricity market and ECREEE has been involved in the promotion of Renewable Energy and Energy Efficiency

- **The West African Energy Pool (WAPP)**



The West Africa Power Pool (WAPP) is the ECOWAS institution established in 1999 by the Assembly of Heads of State and Government of the Economic Community of West African States (ECOWAS). In 2006, the ECOWAS Authority of Heads of State and Government entrusted the WAPP with the task of promoting and developing infrastructure for the production and transmission of electrical energy, as well as coordinating the exchange of electricity among ECOWAS Member States.

The WAPP has a structure in place to carry out the responsibilities entrusted to it, including the WAPP Secretariat, which is the administrative body responsible for the day-to-day management of the activities of the WAPP.

- **The ECOWAS Regional Electricity Regulatory Authority (ERERA).**

Within the framework of the West African Power Trading System (WAPP), the ECOWAS Authority of Heads of State established, in January 2008, by Additional Act A/SA.2/01/08, the ECOWAS Regional Electricity Sector Regulatory Authority (ERERA) as a specialized institution of ECOWAS.

The general mission of ERERA is to ensure the regulation of cross-border exchanges of electricity between ECOWAS Member States, while ensuring the implementation of the conditions to ensure their rationalization and reliability and by contributing to the establishment of a regulatory and economic environment favourable to the establishment of the regional market. The vision is to ensure the application of the highest standards of regulation to achieve a sustainable and efficient regional electricity market in the ECOWAS region

ERERA by missions is:

- To regulate cross-border exchanges of electricity between ECOWAS Member States, while ensuring the implementation of conditions to ensure its rationalization and reliability;
- Contribute to the establishment of a regulatory and economic environment conducive to the establishment of the regional market
- To ensure compliance with the principle of free transit of electrical energy in accordance with the provisions of Article 7 of the Energy Protocol
- Ensure a clear, transparent and predictable pricing methodology for regional electricity trade



- To ensure the technical regulation of regional electricity exchanges and to monitor the functioning of the regional market
- Support the ECOWAS Commission in defining strategic regional policy orientations and harmonizing national policies, legislation and regulations in the field of electricity
- Establish and implement effective dispute settlement procedures between regional market participants and monitor their proper application
- Maintain partnership relations with the national regulatory authorities of the Member States and provide them with technical assistance at their request
- Ensure good communication between the various players in the sector.

### **ECREEE: ECOWAS Centre for Renewable Energy and Energy Efficiency**

ECREEE was officially inaugurated at its headquarters in Praia, Cape Verde, on 6 July 2010, with a mandate to promote and develop renewable energy and energy efficiency and integrate them into the activities of the ECOWAS region.

ECREEE by mission is to contribute to the achievement of several objectives set out in the ECOWAS Regional Strategic Plan for 2023-2027 at the national level.

At this level, there are many institutions that will be able to participate in the implementation and execution of the project, among which we can distinguish:

#### **The Ministries and General Administrations in charge of energy in the various ECOWAS member countries;**

The Government of the country concerned implements the project through the Ministry of Energy and the National Electric Power Company, members of the WAPP. It oversees project activities and those related to environmental and social management

- National Electricity Companies and Private Electricity Companies of ECOWAS Member Countries;
- The Regulatory Institutions of the Electricity Sector of ECOWAS Member Countries, to be involved in the implementation of the Regional Electricity Market Operationalization Project;
- Ministries and General Administrations in charge of the environment in the various ECOWAS member countries
- Institutions and agencies in charge of environmental management in the various ECOWAS member countries



They are the ones who approve the terms of reference of the studies even before the selection of the consultants, validate the scoping reports, validate with the support of the ad hoc technical committee the ESIA reports and prepare the technical opinion to the Minister for the issuance of the environmental certificate or permit. They also monitor and control the proper implementation of environmental and social management plans (ESMPs)

- **Ministries and general administrations in charge of the following sectors: finance, agriculture, territorial administration, industries, mining, water, transport, health, social affairs, gender promotion, employment, security and civil protection, etc.**

During institutional consultations, it is imperative that consultants meet with the consultation of these ministries during the preparation of pre-investment studies, which is essential.

- **Local authorities and traditional and customary chiefs in ECOWAS countries;**
- **NGOs whose field of interest is environmental and/or social;**
- **The Independent Environmental and Social Advisory Panel**

The role of this panel is to advise the PMU, the WAPP and the ECREEE in the preparation of these environmental and social management tools, as some countries do in the choice of mitigation measures and in the decision-making that must be made with regard to the results of the various monitoring programmes.

- **Owner**

It is the legal entity for which the work is built. He validates the program of the operation before entrusting the mission to a project manager.

- **Businesses**

They carry out the work while complying with the regulatory framework in accordance with the requirements of the lessor put in place with the environmental and social management measures associated with the contract for which it is awarded. To do so, they must permanently recruit and mobilize staff specialized in the environment and social and equip themselves with all the tools and equipment necessary to achieve the project's objectives.

- **The Project Manager**

Under the supervision of the Promoter and Contracting Authority in the context of the implementation of the project, the project manager's mission is to ensure that the companies scrupulously comply with their contractual obligations in terms of the environment, social and health and safety at work.

- **Service Providers**

In order to carry out all the tasks incumbent upon it, the PMU will have to contract with various organizations (Firms, Individual Consultants, NGOs, private sector) a certain number of activities



that it will not be able to carry out itself. The selection will be made on the basis of their skills through a clear and transparent process. Each service provider will have a very specific mandate, defined in time and space, translated into terms of reference that will be produced by the national electricity companies.

## 5.2. Legislative and regulatory framework

### 5.2.1. International legislative framework

- **Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment aims to:**

Prevent the generation of waste electrical and electronic equipment and promote reuse, recycling and other forms of recovery in order to reduce the amount of waste to be disposed of.

- **Directive No. 2011/65 of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, adopted by the European Union, aims to:**

Impose restrictions on the use of hazardous substances in electrical and electronic equipment, to protect human health and to promote the environmentally sound recovery and disposal of waste electrical equipment and conventions on the management of e-waste, household appliances and electrical waste.

- The provisions of Articles 3, 29, and 30 of the Revised Treaty of ECOWAS relating to the environment,
- The Supplementary Act A/SA.4/12/08 on the adoption of the ECOWAS environmental policy concerning the harmonization of regulatory texts related to environmental management,
- The regulations on the adoption of regional strategies and the integrated management plan for chemical products and hazardous waste of ECOWAS,
- BEARING IN MIND the guidelines of point 3.2 of the ECOWAS environmental policy related to the treatment of waste and hazardous products, and those of the WAEMU Common Policy for Environmental Improvement, particularly its Strategic Axis No. 2 dedicated to the management of human settlements and combating pollution and nuisances.
- **Regional and international conventions on environmental management**

In addition to its guidelines, all ECOWAS countries have ratified or signed a large number of regional and international conventions and agreements aimed at protecting the environment by limiting pollution and protecting natural resources and biodiversity.





With regard to the protection of wildlife in particular, ECOWAS member countries are signatories to the 1971 Ramsar Convention on Wetlands of International Importance, the 1972 Paris Convention on the Protection of the World's Natural and Cultural Heritage, the 1973 Washington Convention (CITES) on International Trade in Endangered Species of Wild Fauna and Flora, the 1979 Bonn Convention on Migratory Species of Wild Animals, the 1992 Rio de Janeiro Convention on Biological Diversity and the Convention to Combat Desertification (1994).

The table below shows the international conventions signed or ratified by the majority of ECOWAS member countries, which obliges them to respect and apply them.

**Table 1: Regional and International Environmental Conventions and Agreements**

Known as	Full Title	Objective	Relevance to project activities
Convention Ramsar	Convention on Wetlands of International Importance 1971	Halt the global loss of wetlands and promote wetland conservation through wise use and management.	Facilities are planned for coastal regions that host RAMSAR coastal sites.
CITES or the Washington Convention	Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973	Ensures that international trade in specimens of wild animals and plants does not threaten their survival.	No trade in wild animals or plants is anticipated as part of the proposed activities.
CMS or The Bonn Convention	Convention on the Conservation of Migratory Species of Wild Animals, 1979	Concluded under the aegis of the United Nations Environment Programme, it aims to conserve migratory species on land, sea and avian that regularly cross international borders, including international waters. All cetaceans and albatross species in the Southern Hemisphere are listed by CMS.	Several migratory species listed by the Convention as present are present in ECOWAS member countries.
Vienna Convention	Vienna Convention for the Protection of the Ozone Layer of 1985; Montreal	This Convention establishes a framework for cooperation and the formulation of agreed measures to protect human health and the	Under the proposed activities, no ozone-depleting substances are required; therefore, the



Known as	Full Title	Objective	Relevance to project activities
	Protocol, 1987; London Amendment (1990)	environment from adverse effects resulting from changes in the ozone layer caused by human activities. Specific obligations for the control and phase-out of ozone-depleting substances (ODS) are set out in the Montreal Protocol on Substances that Deplete the Ozone Layer.	relevance of this Convention to the proposed activities is low.
Convention de Bamako	Convention on the Prohibition of the Import into Africa of Hazardous Wastes and on the Control of their Transboundary Movement and Management in Africa (1991)	This convention prohibits the import of all hazardous and radioactive wastes into the African continent for any reason and aims to minimize and control the transboundary movement of hazardous wastes within the African continent. The Convention covers wastes other than those listed by the Basel Convention (to which Côte d'Ivoire subscribed on 12/01/1994) and considers any waste described by a hazardous characteristic element or a constituent listed as hazardous waste.	This activity is not required for the proposed project; As a result, the relevance of the Convention is low.
CBD	Convention on Biological Diversity (1992)	Commitment to the conservation of biological diversity, the sustainable use of biological resources and the equitable sharing of the benefits arising from the utilization of genetic resources.	Several species are likely to be impacted by the proposed project. It will be ensured that mitigation measures are in place to minimize the impact of its activities.
UNFCCC	United Nations Framework Convention on Climate Change (UNFCCC) 1994	The Convention establishes a comprehensive framework agreement for intergovernmental efforts to address the challenge of climate change. It recognizes that the climate system is a common resource whose stability can be affected by industrial and other emissions of carbon dioxide and	The activities will result in reductions in greenhouse gas emissions and the company is expected to record them.



Known as	Full Title	Objective	Relevance to project activities
		<p>other greenhouse gases. Côte d'Ivoire is not listed in Annex I of the Decree; therefore, some of the requirements of the Convention do not apply.</p>	
Kyoto Protocol	<p>International Agreement to the United Nations Framework Convention on Climate Change, 1997</p>	<p>Acknowledging that developed countries are primarily responsible for the current high levels of GHG emissions into the atmosphere, resulting from more than 150 years of industrial activities, the Protocol imposes a heavier burden on developed nations, in line with the principle of "common but differentiated responsibilities." Under the Treaty, countries must achieve their goals, primarily through national measures.</p>	<p>The activities will result in greenhouse gas emissions and the company is expected to record them.</p>
Forced Labour Convention	21 Nov 1960	<p>Prohibition of the use of forced or compulsory labour in all its forms;</p> <p>Not considered forced labour:</p> <p>Minor communal services of a nature which, being performed by the members of the community in the direct interest of the said community, provided that the members of the community or their direct representatives have the right to be consulted on the necessity of such services;</p> <p>Any work or service required in the event of an emergency (calamity or threat of calamity, fire, flood, invasion by harmful animals, insects or plants, in general any circumstance likely to endanger the existence or well-being of all or part</p>	<p>Project preparation activities will result in compliance with this Convention</p>



Known as	Full Title	Objective	Relevance to project activities
		<p>of the population benefiting from the project);</p> <p>Punishment of forced labour as a criminal offence and strict application of such sanction.</p>	
<p>Freedom of Association and Protection of the Right to Organise Convention, 1948</p>	<p>21 November 1960</p>	<p>The right of workers and employers, without distinction whatsoever, to establish and, subject only to the rules of the organization concerned, to join organizations of their choice without prior authorization;</p> <p>The right of workers' and employers' organizations to draw up their statutes and regulations, to elect their representatives freely, to organize their administration and activities, to formulate their programmes and to exercise freely without interference the bodies of the Project for the purpose of restricting said rights or dissolving or suspending them;</p> <p>Obligation of workers' organizations to comply with national laws and regulations.</p>	<p>Project preparation activities will result in compliance with this Convention</p>
<p>Right to Organise and Collective Bargaining Convention, 1949</p>	<p>05 May 1961</p>	<p>Adequate protection of workers against acts of anti-union discrimination in relation to their employment;</p> <p>Adequate protection of workers' and employers' organizations against any act of interference with their establishment, functioning and administration;</p> <p>Encouragement and promotion of the development and use of</p>	<p>Project preparation activities will result in compliance with this Convention</p>



Known as	Full Title	Objective	Relevance to project activities
		mechanisms for voluntary bargaining between employers or employers' organizations and workers' organizations, with a view to regulating conditions of work and employment by means of collective agreements	
Abolition of Forced Labour Convention, 1957	05 May 1961	Commitment to suppress and not use any form of forced or compulsory labour as a means of coercion, education, punishment, labour discipline or as a method of mobilizing and using labour for economic development	Project preparation activities will result in compliance with this Convention
Discrimination (Employment and Occupation) Convention, 1958	05 May 1961	Non-discriminatory, any distinction, exclusion or preference with respect to a particular job based on the requirements inherent therein;  Promotion of equal opportunities and treatment in employment and occupation by means of methods adapted to national conditions and practices.	Project preparation activities will result in compliance with this Convention
Minimum Age Convention, 1973	07 Feb 2003	Compliance of the minimum age of employment with national laws and regulations;  Admission to any type of employment or work which, by its nature or the circumstances in which it is carried out, is likely to endanger the health, safety or morals of a person who is at least 18 years of age.	Project preparation activities will result in compliance with this Convention



Known as	Full Title	Objective	Relevance to project activities
Worst Forms of Child Labour Convention, 1999	07 Feb 2003	Prohibition of the worst forms of child labour (forms of slavery or practices similar to slavery, work that may be harmful to health, safety or morals).	In force
Basel Convention	March 22, 1989	Control of Transboundary Movements of Hazardous Wastes and Their Disposal	In force
Rotterdam Convention	September 10, 1998	Prior Informed Consent Procedure for Certain Hazardous Chemicals in International Trade	In force
Stockholm Convention	May 17, 2004	Prohibition of Certain Persistent Organic Pollutants	In force

**Table 1 : Regional and International Environmental Conventions and Agreements**

Source:

ILO.

[https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200\\_COUNTRY\\_ID:103023](https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:103023)

[Accessed June 2023]

In addition to the above-mentioned conventions, ECOWAS beneficiary and member countries are members of the world's leading organizations active in the fields of pollution control, conservation and development, namely the Food and Agriculture Organization (FAO), the World Health Organization (WHO) and the International Union for Conservation of Nature (IUCN). IUCN assesses the conservation status of animal and plant species and assigns them a level of vulnerability. Lists of threatened species (IUCN Red Lists) are published for different countries. Membership in the United Nations includes membership in all organizations under its umbrella, the International Maritime Organization (IMO), the United Nations Cultural, Scientific, and Educational Organization (UNESCO), and associated programs, such as the United Nations Environment Programme (UNEP).

### 5.2.2. Commitments at the regional level

- **Economic Community of West African States (ECOWAS)**

The Economic Community of West African States (ECOWAS) was established on 28 May 1975 by the Treaty of Lagos, with the objective of "promoting cooperation and integration with a view to economic union in West Africa with a view to raising the standard of living of its peoples,



maintaining and increasing economic stability, to strengthen relations among Member States and contribute to the progress and development of the African continent". ECOWAS, through WAPP, promotes and develops infrastructure for the production and transmission of electrical energy in partnership with the national systems of member countries.

According to the Global Carbon Project, the ECOWAS region has a low level of CO<sub>2</sub> emissions estimated in 2018 at 192.9 Mt CO<sub>2</sub>, i.e. 0.52% of the 36,573 Mt CO<sub>2</sub> emitted by all countries on the planet. However, to promote better management of environmental pollution, ECOWAS has developed appropriate regional policies emphasizing the development of renewable energy. Member States intend to increase the share of renewables in the region's overall electricity mix to 19% by 2030. Around 25% of the rural population in ECOWAS is also expected to benefit from connectivity through mini-grids and off-grid systems by 2030.

Various institutions created by ECOWAS are involved in the establishment of an electricity exchange system in West Africa and in the regulation of the Regional Electricity Market (Regional Electricity Regulatory Authority (ERERA), and the promotion of renewable energy (Centre for Renewable Energy and Economic Efficiency (ECREEE)).

- **Regulation C/Reg-16/12/23 on Strategic Environmental and Social Assessment**

Article 38 requiring the conduct of a strategic environmental and social assessment

- 1) Policies, plans, programs, and complex or multi-component projects likely to have negative impacts on the environment are subject to a strategic environmental and social assessment. It ensures the availability of at least the information listed in the annex of this regulation.
- 2) The strategic environmental and social assessment is carried out during the development of the policy, plan, or program and before it is adopted or submitted to the legislative procedure.
- 3) For projects internal to the member states, each member state sets the rules and procedures for assessment related to the implementation of the strategic environmental and social assessment procedure, subject to compliance with the provisions of this regulation.
- 4) Strategic environmental and social assessments of community projects or those with transboundary impacts are subject to the provisions of this regulation.



- **The West African Energy Pool (WAPP)**

The West African Power Trading System (WAPP) is the ECOWAS institution created in 1999 at the Assembly of Heads of State and Government of the Economic Community of West African States (ECOWAS). In 2006, the ECOWAS Authority of Heads of State and Government entrusted WAPP with the task of promoting and developing infrastructure for the production and transmission of electrical energy and of ensuring the coordination of electricity exchanges among ECOWAS Member States.

- **ECOWAS Protocol A/P4/1/03 ON ENERGY, 2002**

The Protocol establishes a legal framework to promote long-term cooperation in the field of energy, based on complementarity and mutual benefit, with a view to increasing investment in the energy sector and expanding energy trade in the West African region.

- **Guidelines for the Assessment of Environmental and Social Impacts of Electricity Generation and Transmission Systems in West Africa, 2005**

As part of the implementation of its energy policy, the Economic Community of West African States created the West African Power Pool (WAPP) in 2000, the main mission of which is to develop a regional system for the sustainable supply of electricity to promote economic growth in the region.

In addition, ECOWAS countries are becoming increasingly aware of the problems of environmental degradation resulting from development activities, particularly in the electricity sector. Indeed, high-voltage transmission lines impose environmental control measures because of the problems of rights of way they imply and the impacts related to electromagnetic fields. Based on these observations, and given the importance of the electricity sector for economic and social development, it was decided to develop the ECOWAS EIA Guidelines for the Production and Transmission of Electrical Energy.

The purpose of these Guidelines is to assist Member States, national electricity companies and other stakeholders in the preparation, conduct and assessment of the environmental impacts of electric power projects. These Guidelines contain eight (8) sections consisting of the following elements:

- Section 1: ECOWAS EIA Guidelines for the Production and Transmission of Electrical Power
- Section 2: Background to the EIA





- Section 3: Environmental Impact Assessment Procedures in ECOWAS Member States
- Section 4: The EIA Process
- Section 5: Specific provisions for the EIA of thermal power plants for the production of electrical energy
- Section 6: Specific Provisions for EIA of Hydropower Plants
- Section 7: Specific Provisions for EIA of Transmission Lines
- Section 8: EIA Case Studies.

- **Regional Gender Guidelines and Conventions**

**ECOWAS Guideline on Gender Equality Assessments in ECOWAS Energy Projects for Gender Mainstreaming:**

- Aims to promote equitable access to energy services for all, without gender discrimination.
- It is part of the ECOWAS policy for gender mainstreaming in energy access.
- Commits to promoting equal rights between women and men in sustainable development (Gender Equality)
- Encourages the active participation of stakeholders, including communities and project workers. (Consultation and Participation).
- Aims to minimize negative and discriminatory impacts on women and men throughout the energy cycle (Impact Assessment).

**Convention on the Elimination of All Forms of Discrimination against Women. (CEDAW) (1979): CEDAW was adopted.**

**And these fundamental principles are:**

- Non-discrimination: CEDAW prohibits discrimination on the basis of sex.
- Equality before the law: Women must have the same rights as men.
- Elimination of stereotypes: This encourages the transformation of social and cultural norms that perpetuate gender inequalities.

- **ECOWAS Environmental Policy, 2008**

By emphasizing regional integration and the strategic role of natural resources in the economic development of the sub-region, the overall objective of the Common Environmental Policy is to reverse the serious trends of degradation and reduction of natural resources, environments and



the living environment, with a view to ensuring a healthy, easy-to-live and productive environment in the sub-region. thus improving the living conditions of the populations of the sub-regional area.

As a reminder, the ECOWAS authorities have defined a Vision 2020 which aims to transform the community space into "a borderless region where citizens can benefit from the opportunities and sustainably exploit the immense resources of the region".

The vision of the environmental policy calls for "a peaceful, dignified and prosperous ECOWAS region whose diverse and productive natural resources are preserved and managed in a sustainable manner for the development and balance of the sub-region in order to better control and manage production, processing, consumption, trade and disposal activities in a healthy environment, from the point of view of raw material flows, waste and end processes.

The overall objective of the ECOWAS Environmental Policy adopted by Supplementary Act A/SA.4/12/08 of 12 December 2008 is "to reverse the degradation of the environment and the depletion of natural resources, to improve the quality of the living environment, to conserve biological diversity, with a view to ensuring a healthy and productive environment; thereby improving the well-being of the ecosystem and the population of the sub-region."

This policy is structured around the following four (4) strategic areas of action:

- Strengthening of environmental governance (establishment of a sub-regional mechanism) and development of capacities for this purpose;
- Promotion of sustainable resource management to improve the sub-regional economy while respecting the environment;
- An organized fight against pollution and environmental nuisances, urban waste and the control of the movement of hazardous waste/products in the economy;
- Promotion of information, education and communication for a healthy environment.

An action plan for the implementation of the policy was developed and technically validated in November 2008. The implementation covered the period 2008 – 2014, at the end of which there should be at least one update or revision of the environmental policy and its action plan

- **The ECOWAS Regional Electricity Regulatory Authority (ERERA).**

The commitment of ECOWAS Member States to implement electricity interconnections with a view to the optimal pooling and sharing of the region's energy resources has resulted in the adoption of a number of provisions aimed at establishing an appropriate institutional and legal environment for the development of the West African electricity sector.



Thus, within the framework of the West African Power Trading System (WAPP), the ECOWAS Authority of Heads of State set up, in January 2008, by Additional Act A/SA.2/01/08, the ECOWAS Regional Electricity Sector Regulatory Authority (ERERA) as a specialized institution of ECOWAS.

The general mission of ERERA is to ensure the regulation of cross-border exchanges of electricity between ECOWAS Member States, while ensuring the implementation of the conditions to ensure their rationalization and reliability and by contributing to the establishment of a regulatory and economic environment favourable to the establishment of the regional market. The vision is to ensure the application of the highest standards of regulation to achieve a sustainable and efficient regional electricity market in the ECOWAS region

ERERA's missions are as follows:

- To regulate cross-border exchanges of electricity between ECOWAS Member States, while ensuring the implementation of conditions to ensure its rationalization and reliability;
  - Contribute to the establishment of a regulatory and economic environment conducive to the establishment of the regional market
  - To ensure compliance with the principle of free transit of electrical energy in accordance with the provisions of Article 7 of the Energy Protocol
  - Ensure a clear, transparent and predictable pricing methodology for regional electricity trade
  - To ensure the technical regulation of regional electricity exchanges and to monitor the functioning of the regional market
  - Support the ECOWAS Commission in defining strategic regional policy orientations and harmonizing national policies, legislation and regulations in the field of electricity
  - Establish and implement effective dispute settlement procedures between regional market participants and monitor their proper application
  - Maintain partnership relations with the national regulatory authorities of the Member States and provide them with technical assistance at their request
  - Ensure good communication between the various players in the sector.
- **ECREEE: ECOWAS Centre for Renewable Energy and Energy Efficiency**

Over the past few years, the ECOWAS Commission has gradually taken steps to integrate Renewable Energy (RE) and Energy Efficiency (EE) into its regional activities and policies. The experience of the European Union (EU) has demonstrated that regional integration can be a useful tool for the adoption and implementation of RE and EE policies and incentives at national level (e.g. the EU Directive with binding renewable energy targets).



ECREEE was officially inaugurated at its headquarters in Praia, Cape Verde, on 6 July 2010, Its ECREEE mandate is also fully aligned with the broader strategic objectives of the ECOWAS Vision for the Year 2020. The mandate seeks to directly realize two of the components of this vision, namely: (1) "A region that anchors its development on sustainable development, including the strategy for the development of agricultural and mineral resources, and on planned agricultural and industrial strategies; a region that develops its infrastructure and provides accessible services to its citizens and businesses"(2)"a region that preserves its environment and resources, that promotes equitable and sustainable economic, social and environmental development; a region that makes its full contribution to solving the problems and challenges facing the planet."

In 2003, the ECOWAS Energy Protocol envisaged improved energy efficiency and increased use of renewable energy sources. In 2006, ECOWAS/UEMOA adopted the White Paper on Access to Energy Services for Rural and Peri-urban Populations. The White Paper foresees that at least 20% of new investment in electricity generation should come from locally available renewable resources, in order to ensure energy self-sufficiency, reduced vulnerability and sustainable environmental development.

Most countries and those benefiting from the WAPP project have basic laws that deal with environmental management. In all cases, they have developed and adopted policies to protect the environment. Relevant national/international laws, regulations, policies and treaties.

### 5.2.3. Some National strategic provisions and sectoral policies

Various strategic documents (policies, plans and programmes) provide a framework for the orientations of ECOWAS member countries with regard to the environment, energy, and the social and gender dimension. The table presents the relevant documents of the policy frameworks of West African countries to be considered in the planning and implementation of the project.

**Table 2: Key Strategic and Policy Provisions**

Domain	Relevant policies, plans and programs
<b>Environment</b>	<ul style="list-style-type: none"> <li>• National Climate Change Adaptation Plan</li> <li>• National Environmental Protection Plan</li> <li>• National Renewable Energy Plan</li> <li>• National Action Plan for Integrated Water Resources Management (PANGIRE)</li> <li>• Ozone Action Plan</li> </ul>



	<ul style="list-style-type: none"> <li>• National Action Plan for Hazardous Waste Management</li> <li>• National Action Programme to Combat Desertification</li> <li>• National Strategy to Combat Air Pollution in Urban Areas</li> <li>• National Sustainable Development Strategy (NSSD)</li> <li>• National Forest Policy</li> <li>• National Spatial Planning Policy</li> <li>• National Policy on Decentralization and Deconcentration</li> <li>• National Policy for Land Security in Rural Areas</li> <li>• National Physical Cultural Resources Policy</li> <li>• National Adaptation Programme of Action (NAPA)</li> <li>• Strategic Development Directions</li> <li>• National Development Plan (NDP)</li> <li>• National Environmental Action Plan (NEAP)</li> <li>• National Framework Plan for the Prevention and Eradication of Child Labour</li> <li>• National Water Policy (NWP)</li> <li>• National Health Policy (NHP)</li> <li>• National Hygiene and Sanitation Policy</li> <li>• National Energy Policy</li> <li>• National Sanitation Policy (NAP)</li> <li>• Agricultural policy</li> <li>• Sectoral policy for the development of water and sanitation</li> <li>• National Wetland Management Policy (NWMP)</li> <li>• National Strategy and Action Plan for the Conservation of Biological Diversity</li> <li>• Strategy for Economic Recovery and Sustainable Development</li> <li>• National Strategy for the Sustainable Conservation and Use of Biological Diversity</li> <li>• National Strategy and Action Plan for Biodiversity</li> <li>• National Circular Economy Strategy</li> <li>• Sustainable Development and Inclusive Growth Strategy</li> <li>• Agenda 21 national</li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>• Strategic Environmental Assessment of the Energy Sector</li> <li>• Energy policy</li> <li>• Electricity Policy</li> <li>• Energy management strategy</li> </ul>
<b>Social &amp; Gender</b>	<ul style="list-style-type: none"> <li>• National Policy for the Promotion of Gender (PNPG)</li> <li>• National Social Protection Policy</li> </ul>



	<ul style="list-style-type: none"> <li>• National Community Health Policy</li> <li>• National Health Promotion Policy</li> <li>• National Employment Policy</li> <li>• National Strategy for Gender Equality and Equity (SNEEG)</li> <li>• National Economic and Social Development Policy</li> <li>• Poverty Reduction Strategy</li> <li>• Gender Mainstreaming Strategy in the Energy Sector</li> </ul>
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**Table 2 : Key Strategic and Policy Provisions**

### 5.3. National legislative and regulatory frameworks

All ECOWAS member countries treat environmental management as a legal and moral obligation to their fellow citizens

The constitutions of all West African countries have laid down certain principles relating to the environment and the living conditions of their citizens. These principles can be found in the various articles that have given clear guidelines such as:

- The State shall ensure that its citizens have equal access to health, education, culture, information, vocational training and employment.
- Everyone has the right to own property. No one may be deprived of his property except for reasons of public utility and against fair and prior compensation;
- Everyone has the right to a healthy, satisfying and sustainable environment and has a duty to defend it. The State shall ensure the protection of the environment;
- The storage, handling and disposal of hazardous or polluting waste is regulated by law;
- The transit, import, storage, burial or dumping of toxic waste or foreign pollutants on the territory is a crime against the Nation;
- Laying down the fundamental principles of environmental protection and conservation of natural resources

In addition, West African countries have detailed legislative and regulatory frameworks that provide a framework for the protection of the environment and the living environment of populations. The main legal documents in the areas of the environment, energy, resettlement of populations and cultural resources exist in the form of laws or decrees.



**Table 3: Main constituents of the project's legal framework**

Domain	Relevant legal texts and key national standards
Environment and quality of life	<p>Framework Law on the Environment</p> <p>Law on the Public Health Code</p> <p>Climate Change Act</p> <p>Water Management Act or Code</p> <p>Law on the management of chemicals and their waste</p> <p>Law on the Regulation of Nature Protection and Hunting</p> <p>Law on the Regime of Forests</p> <p>Law on Territorial Organization</p> <p>Law on the Land and State Code</p> <p>Law on the Protection of Cultural Heritage</p> <p>Wildlife Act</p> <p>Law on the Protection and Rules for International Trade in Endangered Species of Wild Fauna and Flora</p> <p>Law on the Prevention and Punishment of Violence against Women</p> <p>Labor Law or Code</p> <p>An Act to establish the conditions and procedure for hiring, placing workers and terminating employment contracts</p> <p>Children's Code Act</p> <p>Decree on the Organization of Environmental and Social Assessment Procedures</p> <p>Decree on the powers, organization and functioning of the Ministry of the Environment</p> <p>Solid Waste Management Decree</p> <p>Decree on the Management of Waste Oils</p> <p>Decree setting air quality standards</p> <p>Decree on the Regulation of Noise</p>



	<p>Decree setting waste water quality standards</p> <p>Decree setting drinking water quality standards</p> <p>Decree organizing environmental and social assessment procedures</p> <p>Decree on ecologically sound management of waste electrical and electronic equipment</p> <p>Decree organizing environmental and social assessment procedures</p>
Access to Information	Information and communication law or code
Involuntary displacement and resettlement of populations	<p>The Constitutions of the Countries</p> <p>Law on the definition and modalities of development of rural development perimeters</p> <p>Law No. 2013-01 on the Land and State Code</p> <p>Decree on the Composition and Model Functioning of the Commissions of Inquiry of Commodo and Incommodo and of Compensation in Matters of Expropriation in the Public Interest</p> <p>Decree on the attributions, organization and operation of the land compensation fund</p> <p>Decree laying down the terms and conditions for exercising the right of pre-emption and hire-purchase of pre-empted or expropriated buildings</p> <p>Decree on the conditions and modalities of occupation of the public domain.</p>
Cultural Resources	Law on the Protection of Cultural Heritage
Agriculture	<p>Law on the definition and modalities of development of rural development perimeters</p> <p>Decree on the classification of routes of economic, tourist or strategic interest</p>
Energy	<p>Law on the Electricity Code</p> <p>Decree on the Establishment of Applicable Procedures and Standards and Conditions for the Exercise of Inspection and Technical Control of Electricity Supply Installations</p>

**Table 3 : Main constituents of the project's legal framework**





## 5.4. Analysis of International Funding Agency Guidelines

The implementation of the project, in addition to being subject to national environmental and social protection requirements, must comply with international best practices. The World Bank's (WB) environmental and social standards and the African Development Bank's (AfDB) operational safeguards will need to be integrated into the project cycles. This is also the case for the various requirements of co-financing agencies, including the French Development Agency (AFD), the Kreditanstalt für Wiederaufbau (KfW) and the European Union (EU). AFD and KfW's environmental and social protection frameworks are in line with the IFC's Sustainability Framework, while the EU has its own environmental guidelines and policies. The main environmental and social standards that the project must meet are presented in the following sections.

### 5.4.1. Key World Bank Environmental and Social Safeguard Policies Applicable to the Project

The World Bank adopted a new Environmental and Social Framework (ESF) on October 1, 2018. This ESC reaffirms the World Bank's commitment to sustainable development through ten Environmental and Social Standards (ESS), designed to help borrowers manage environmental and social risks. The World Bank's Environmental and Social Framework (ESF) is systematic, modern, and harmonized. It takes into account current issues such as: climate change, gender parity, non-discrimination and disability. It allows for an adaptive management of the risks and effects of the project and integrates both environmental and social dimensions into all 10 Standards.

The Bank believes that the application of these standards, with a focus on identifying and managing environmental and social risks, will assist Borrowers in their objective of reducing poverty and increasing prosperity in a sustainable manner for the benefit of the environment and their citizens.

After analyzing the relevance of each of the 10 NESs, their relationship with the project in terms of the environment was verified. Depending on the nature, characteristics and scope of the work envisaged as part of the execution of the project, nine (09) NES are applicable to the project.

These are: NES No. 1, Assessment and Management of Environmental and Social Risks and Effects; NES No. 2, Employment and Working Conditions; NES No. 3, Resource Efficiency and Pollution Prevention and Management; NES n°4, Health and safety of the population; NES No.



5, Land Acquisition, Land Use Restrictions and Forced Resettlement; NES n°6, Preservation of biodiversity and sustainable management of biological natural resources; NES No. 7 applies to "Historically Disadvantaged Indigenous Peoples/Traditional Local Communities of Sub-Saharan Africa"; NES n°8, Cultural Heritage; NES n°9 NES n°9, Financial Intermediaries and NES n°10, Stakeholder Engagement and Information.

The application of the ESC NES enables the World Bank and borrowing countries to avoid, minimize, mitigate, or offset the environmental and social impacts of World Bank-financed activities. These policies allow all actors who will be involved in the implementation of each project to take into account the importance of the environmental and social aspects of the project activities from the preparation phase.

- **Environmental and Social Standards 1: Assessment and Management of Environmental and Social Risks and Effects**

ESS No. 1 is relevant to the project, as the activities planned under the project are expected to present moderate environmental and social risks such as destruction of vegetation cover, pollution of surface and groundwater, soil pollution by waste generation, noise emissions, disruption of economic activities, etc.

- **Environmental and Social Standards 2: Employment and working conditions**

SEN No. 2 is relevant to the project, as there are occupational hazards for the project workers. These risks include: (i) hazards to the safety of project workers, (ii) traffic and road safety problems, (iii) inadequate conditions of employment, and (iv) occupational health and safety hazards.

- **Environmental and Social Standards 3: Resource Efficiency and Pollution Prevention and Management**

NES No. 3 is relevant to the project, as it requires the use of natural resources such as sand, gravel, water, etc. Similarly, there is a risk of pollution of watercourses and bodies of water near the work sites.

- **Environmental and Social Standards 4: Health and safety of the population**

NES No. 4 is relevant to the project, as there are health risks (respiratory problems, colds, epidemics/pandemics, etc.) and safety risks (work and traffic accidents, etc.) for workers and local communities.

- **Environmental and Social Standards 5: Land Acquisition, Land Use Restrictions and Involuntary Resettlement**



ESS No. 5 is relevant to the project, as the activities planned under the project would result in possible land acquisition, economic and/or physical displacement of people affected by the project.

- **Environmental and Social Standards 6: Preservation of biodiversity and sustainable management of biological natural resources**

ESS No. 6 is relevant to the project, as the activities planned under the project would cause the destruction of natural habitats and local biodiversity in the areas of the activities. Project activities may affect the access or use of biodiversity or living natural resources by affected populations. It may also have the introduction of invasive species.

- **Environmental and Social Standards 7: Historically disadvantaged Indigenous Peoples/Traditional Local Communities in Sub-Saharan Africa.**

NES No. 7 is relevant to the project, because prior to its implementation, the project will ensure that the development process promotes full respect for the rights, dignity, aspirations, identity, culture and livelihoods based on natural resources, limiting adverse effects that could affect them while promoting benefits and opportunities.

- **Environmental and Social Standards 8: Cultural Heritage**

NES No. 8 is relevant to the project, as the beneficiary countries of the project have a relatively rich cultural heritage, but this is not specifically targeted by the project activities. However, it is possible that during the work, archaeological or cultural remains may be discovered by chance.

- **Environmental and Social Standards 9: Financial intermediaries**

NES No. 9 is relevant because the World Bank is committed to supporting the sustainable development of the financial sector and strengthening the role of capital and financial markets at the country level.

- **Environmental and Social Standards 10: Stakeholder engagement and information**

SEN 10 is relevant to all projects given the need to consult beneficiaries and stakeholders on development activities that affect their lives.

#### **5.4.2. African Development Bank Safeguard Policies**

The African Development Bank's Integrated Safeguard System (ISS) environmental and social safeguards are the cornerstone of the Bank's measures to support economic growth and environmental sustainability in Africa. It is a set of five operational safeguards (SO) requirements that AfDB clients must comply with in contexts of environmental and social risks and impacts:



- **Operational Safeguard 1** : Environmental and Social Assessment – This overarching SO governs the process of determining the environmental and social category of a project and the resulting environmental and social assessment requirements.
- **Operational safeguard 2** : Involuntary resettlement, land acquisition, displacement and compensation. This OS consolidates the policy conditions and commitments set out in the Bank's policy on involuntary relocation and incorporates a number of improvements designed to increase the operational effectiveness of these conditions.
- **Operational Safeguard 3** : Biodiversity, Renewable Resources and Ecosystem Services – This OS aims to conserve biodiversity and promote the sustainable use of natural resources. It also reflects the political commitments contained in the Bank's Integrated Water Resources Management Policy and the operational requirements of these conditions.
- **Operational Safeguard 4** : Prevention and Control of Pollution, Hazardous Materials and Resource Efficiency – This OS covers the full range of impacts related to pollution, waste and hazardous substances, including the greenhouse gas inventory, for which international conventions are in force as well as comprehensive standards specific to the industrial or regional environment, which are applied by other multilateral development banks.
- **Operational Safeguard 5** : Working Conditions, Health and Safety – This SO sets out the Bank's requirements to its borrowers or customers regarding workers' conditions, rights, and protection from abuse or exploitation. It also ensures better alignment with most other multilateral development banks.

#### 5.4.3. Environmental and social policy of the European Union (EU)

The Treaty of Amsterdam made it mandatory to integrate environmental protection requirements into the policies of the European Community (EC). In addition, the promotion of sustainable development is one of the EC's main development and cooperation objectives. *European environmental policies are based on the principles of precaution, prevention and correction of pollution at source, as well as the polluter-pays principle.* Multi-annual environmental action plans set out the activities planned under the environmental framework. These programmes are part of horizontal strategies and are integrated into international environmental negotiations. The



policies set out the role of the impact assessment in environmental and social protection for each project cycle. Environmental problems fall into seven broad categories:

- Climate Change;
- Biodiversity, nature and soils;
- Water protection and management;
- Air and noise pollution;
- Efficient resource and waste management;
- Sustainable consumption and production;
- Chemicals.

The EU's employment and social policy aims to increase the employability and mobility of workers, improve the quality of jobs and working conditions, inform and consult workers, combat poverty and social exclusion, promote equal opportunities and reduce discrimination, and modernise social systems.

The EU has a specific policy reflecting the importance of environmental protection in economic and cooperative development activities with emerging countries: "integration of sustainable development and the environment into economic policies for development and cooperation". The success and stability of development programmes and projects undertaken by the EC and its members are influenced by the way they interact and depend on natural resources. A preliminary EA of projects helps determine the extent of environmental measures required. For projects requiring further action, the Environmental Impact Assessment (EIA) assesses environmental concerns throughout the project cycle.



#### 5.4.4. French Development Agency

AFD is engaged in an active partnership with many local financial partners (PFLs), in particular through its SUNFREF initiative, AFD's green finance label. Through SUNREF, AFD promotes climate change mitigation and adaptation investments in developing countries. Since AFD advocates sustainable and equitable development in the projects it finances, they are required to comply with the national regulations of the country in which the operations are implemented. However, when these regulations are incomplete or under development, AFD uses the performance standards of international donors such as the World Bank, the United Nations Principles for Responsible Investment (UNPRI) or the IFC.

In terms of controlling environmental and social standards, AFD relies on IFC standards.

#### 5.4.5. KfW Development Bank

The sustainability guidelines of the KfW Bankengruppe (2016) aim to:

- Define a rigorous framework that integrates environmental, social and climate standards into the planning, evaluation, implementation and monitoring of the Financial Corporation's actions;
- Strengthen transparency, predictability and accountability in the decision-making processes of internal Environmental & Social Due Diligence (ESDD) and climate assessments;
- Improve due diligence on the economic risks associated with the Financial Corporation's (FC) actions, taking into account environmental, climate and social aspects.

One of the key principles is protection against risks to the environment and social concerns. The minimum requirement is compliance with national legislation. However, in order to maintain appropriate environmental and social standards, KfW applies and adheres to internationally recognised environmental and social standards. In the context of the project, these are the IFC Performance Standards, supported by the World Bank's Environmental and Social Standards (ESS) and the Sectoral SSE Guidelines for Electricity Transmission and Distribution, the Basic Principles and the United Nations Guidelines on Development-Related Involuntary Evictions and Displacement, and the labour standards of the International Labour Organization (ILO).

#### 5.4.6. International Finance Corporation Performance Standards



In January 2012, the International Finance Corporation (IFC) published its Performance Standards (PS) for environmental and social sustainability. These standards are recognized as the most comprehensive standards available to international financial institutions working in the private sector. The principles provide a framework for an international approach to managing environmental and social issues.

The seven performance standards applicable to the project are as follows:

- **NP 1:** Assessment and management of environmental and social risks and impacts. PS 1 emphasizes the importance of managing environmental and social performance throughout the project life cycle. This standard requires the proponent to conduct an environmental and social assessment process and to establish and maintain an environmental and social management system that is appropriate to the nature and scale of the project, and that it is also proportionate to the environmental and social risks and impacts that are likely to be generated by the project.
- **NP 2:** Labour and working conditions. PS 2 recognizes that the creation of jobs and the generation of income generated by economic growth must be accompanied by the protection of workers' fundamental rights.
- **NP 3:** Resource Efficiency and Pollution Prevention. NP 3 recognizes that increased economic activity and urbanization generate increased levels of air, water and soil pollution. In addition, this NP recognizes that the exploitation of natural resources can lead to negative impacts that threaten people and the environment at local, regional and global scales.
- **NP 4:** Community Health and Safety. PS 4 recognizes that project activities, equipment, and infrastructure may increase the host community's exposure to project risks and impacts.
- **NP 5:** Land acquisition and involuntary resettlement. NP 5 recognizes that the acquisition of project-related land and restrictions on land use may have negative impacts on the communities and individuals who use the land.
- **NP 6:** Conservation of biodiversity and sustainable management of living natural resources. NP 6 recognizes that the protection and conservation of biodiversity, the maintenance of ecosystem services, and the sustainable management of living natural resources are fundamental to sustainable development.



- **NP 8:** Cultural Heritage. PS 8 recognizes the importance of cultural heritage for present and future generations.

#### 5.4.7. Environmental Policy of the West African Development Bank (BOAD)

The West African Development Bank's (BOAD) environmental and social safeguard policies aim to promote socially and environmentally sustainable development approaches, and to ensure that the operationality of projects does not harm people and natural resources. They include the environmental assessment policy. BOAD's Operational Policy (OP) on environmental and social impact assessment of projects is:

- **PO1:** BOAD requests that projects submitted to it for financing be subject to an Environmental and Social Impact Assessment (ESIA) that helps to ensure that the said projects are environmentally sound and socially viable to facilitate the decision-making process.
- **PO2:** The Environmental and Social Impact Assessment (ESIA) consists of assessing the risks that the project may pose to the environment and the effects that it is likely to exert in its area of influence, to study variants of the project, to identify ways to improve the selection of the project, its location, its planning, its design and its execution by preventing, minimising, mitigating or compensating for its negative effects on the environment, and enhancing its positive effects.
- **OP 3:** The proponent will conduct an Environmental and Social Impact Assessment process, implement and maintain an Environmental and Social Management System (ESMS) appropriate to the nature and scale of the project and proportionate to environmental and social risks and impacts. The ESMS includes the following elements: (i) Policy Statement; (ii) identification of risks and impacts; (iii) management programme; (iv) organizational capacity and skills; (v) emergency preparedness and response; (vi) stakeholder engagement and (vii) monitoring and evaluation.
- **OP 4:** The ESIA also includes the process of mitigating and managing nuisances throughout the duration of the project. BOAD advocates the use of preventive measures rather than mitigation or compensation measures, whenever possible.
- **OP 5:** The Environmental and Social Impact Assessment takes into account the natural environment (air, land and water), the health and safety of the population, social aspects (involuntary displacement of people, and cultural heritage), and transboundary and global





environmental problems. ESIA considers the natural and social contexts in an integrated manner.

It also takes into account variations in the project context and the national situation, the findings of the country's environmental studies, the national environmental action plans, the country's general economic policy framework, its national legislation and its institutional capacity in the field of environment and society, as well as the country's obligations in relation to the project activities, in accordance with relevant international environmental treaties and agreements.



## 6. Environmental Analysis of Battery Storage Systems

What are the activities, sources of impact in the installation, operation and dismantling of the electrical energy storage system and the elements of the environment likely to be affected by these activities?

### 6.1. Activities, Sources of Impacts and Valued Elements of the Environment

The installation and operation of the battery storage system, which are sources of impacts, are as follows:

**Table 4: Activities, sources of environmental impacts of BESS**

Sources d'impacts	Description
<b>Pre-construction phase and construction</b>	
Mobilization of soil to be used as a site	Acquisition of land necessary for the development of battery storage systems,  Possibility of displacement and resettlement of population and relocation of infrastructure (parcels, dwellings, secondary structures, trees and economic activities located within the boundaries of the project and subject to the RAP) The release of the project area to be carried out before the start of the construction work.
Installation of the base camp	Setting up temporary facilities dedicated to people working on the construction site.
Development of access and construction work areas	Preparation for construction: clearing, development of accesses and work areas, and storage of materials. Possibility of displacement and resettlement of population and movement of infrastructure.
Exploitation of construction material borrowing areas	Exploitation of the various quarries, gravel pits and sand pits for the supply of backfill materials.
Transport and Traffic	Road transport of labor, materials, and equipment needed for construction, including the movement of construction machinery on-site and the maintenance of roads and accesses.



Construction Activities and Equipment Installation	All activities related to heavy machinery work, excavations and digging, pouring of concrete bases, and construction of buildings to house the batteries.  Installation, securing, and wiring of storage batteries.  Setting up the electrical devices necessary for storing and reusing the stored energy.
Management of Waste, Residual Materials, and Hazardous Products	Storage, handling, and transportation of hazardous products, contaminants, residual materials, waste, and other materials for disposal
<b>Operation phase</b>	
Commissioning of the battery storage system	Activities related to the commissioning tests of substations and lines
Operation of storage facilities	Battery monitoring and maintenance activities
<b>Battery dismantling phase</b>	
Management of defective batteries, residual materials and dangerous products	Storage, handling and transportation of hazardous products, contaminants, residual materials, waste and other materials to be eliminated.

**Table 4 : Activities, sources of environmental impacts of BESS**

The valued elements of the environment affected by the installation of a battery storage system are as follows:

**Table 5: Valued Elements of BESS's Environment**

<b>Physical Environment</b>	
Ambient air and greenhouse gas (GHG) emissions	The atmospheric environment (physicochemical quality of the air, including dust content) is an EVA because of its importance to the health and well-being of humans, wildlife and plants.  Climate change and greenhouse gases are considered because of the potential input of



	greenhouse gases generated during the construction and operation of the project.
Sonic ambiance	Characteristics of the ambient noise level.
Soils and agricultural potential	Soils represent an EVA because they contribute to the functioning of ecosystems and their composition influences their use.
Water Resources	Considering the site development and infrastructure construction works in front of the batteries, surface and groundwater are an EVE considering the national legislation aimed at its protection in relation to its various uses and the high value that the population attaches to it as a source of drinking water.
Biological environment	
Vegetation	Considering the characteristics of the installation sites, vegetation is a VE since this resource is essential to the proper functioning of the ecosystem. Vegetation distribution, density and composition are important features of natural habitats.
Wildlife and Wildlife Habitat	Avian, terrestrial, aquatic and wildlife habitats form an EVA because of their ecological importance. In addition to this ecological importance, there are aesthetic, economic and recreational values for the population.
Biodiversity	The chosen battery storage system installation site(s) may be home to specific dwellings of certain endemic plant and wildlife species of considerable ecological value or threatened with extinction
Human environment	
Land Allocation and Use	Land use and land use are valued elements of the environment since the project is an infrastructure



	that can change them if it is not well integrated into the environment.
Existing infrastructure	The installation of battery storage systems reinforces electricity production and thus makes the operation of existing electricity grids more reliable and flexible.
Development and economic dynamics	The increase in access to electricity resulting from the installation of energy storage systems is a guarantee for the economic and cultural development of ECOWAS member countries
Employment, economy and livelihoods	Employment and the economy (local and regional economic development, jobs, employability of the workforce, incomes and livelihoods of affected communities) are VCEs considering the interest of the population in these aspects.
Local travel	The fluidity of safe travel is an EVE. It is essential to allow the population to be able to move around and access the places they have to go to at all times. Such movement must not be hindered or become a source of danger.
Quality of life, health, safety and other disturbances	The well-being of the population in relation to their ambient environment, their physical safety and the perception of situations that may constitute risks to their environment and/or their health in relation to the following elements: water and air quality, noise environment, ground vibrations, economic security, risk perception and services to the community are EVEs.
Social cohesion and gender relations	Healthy harmony between users of an environment is important, mutual respect for people and healthy coexistence between the various users of the environment. The nature and intensity of social relationships, including gender relations.



Aspects Gender and Vulnerable Groups	Persons who, because of their gender, ethnicity or age, because of a physical or mental disability, because of their economic disadvantage or because of their social status, could be disadvantaged.
Archaeological and cultural heritage	Heritage and archaeological resources (Heritage, Sacred Sites and Areas of Archaeological Potential) are EVEs given their associated regulatory requirements, their interest to the community and the value placed on them by the public.

**Table 5 : Valued Elements of BESS's Environment**



Project Phase	Associated Risks
Construction and Installation	<ul style="list-style-type: none"> <li>- Risks of noise pollution and ambient air pollution</li> <li>- Risks of accidents to personnel and the population</li> <li>- Risks of increased contamination and spread of STIs, HIV/AIDS, and COVID-19</li> <li>- Risk of an influx of labor in search of employment</li> <li>- Risks of weakening local structures</li> <li>- Risk of exacerbating behaviors of exploitation and sexual abuse and harassment (SA/SH)</li> <li>- Risk of marginalization of vulnerable groups</li> <li>- Risks of alteration of the living environment</li> </ul>
Transport and Operation	<ul style="list-style-type: none"> <li>- Risks of accidents to personnel</li> <li>- Risk of electrocution</li> <li>- Risks of explosion and/or fire</li> </ul>
Dismantling	<ul style="list-style-type: none"> <li>- Risk of soil pollution by waste and hazardous materials</li> <li>- Risks of accidents to personnel</li> </ul>

**Table 6 : Risk Mapping of Different Project Phases**

## 6.2. Potential Positive Impacts

### 6.2.1. Positive impacts on the physical environment

- **Storage of renewable energy for later use as a replacement for polluting energy**

The stored energy would have to be produced by a more polluting system. It is a clean energy gained by saving the pollution that must come from its production.

- **Increased flexibility and reliability of the power grid**

The availability of energy through electrical energy storage makes it easier to operate the grid and creates fewer difficulties.

- **Better Power Grid Development Planning**



Battery energy storage allows operators to better plan their network investments and operating costs

- **Reduction of CO2 and greenhouse gas (GHG) emissions through more polluting equivalent production**

**Impact Assessment:**

The BESS project will lead to a significant reduction in emissions, generating positive externalities for the region. Indeed, the finalization of the synchronization of electricity grids for an interconnected and synchronized sub-regional grid will increase the exchange of electrical energy between ECOWAS countries and reduce the operating needs of polluting thermal power plants that emit carbon dioxide.

Measuring the carbon footprint makes it possible to compare different lifestyles or societies by their ecological impact. It thus provides avenues for improvement for consumers concerned about limiting the impact of their consumption on the environment. Regarding the BESS project, it is that the region is at high risk of river and urban flooding, water scarcity, extreme heat and forest fires. Any reduction in regional emissions can help countries avoid significant damage to scarce and valuable human and natural capital. Under the scenario, the regional project is expected to reduce GHG emissions. The reduction of greenhouse gases is of medium importance and deserves to be maximized.

**Impact assessment**

Potential for reduction of CO2 and greenhouse gas (GHG) emissions and impact on climate change resulting from grid synchronization				
Nature of the impact	Intensity	Duration	Extent	Consequence
Positive	Average	Long-term	Regional level	Strong

**Enhancement measures**

To maximize this reduction in greenhouse gas emissions, it would be good to further promote the production of renewable energies, particularly solar energy, and, for ongoing projects, encourage stakeholders to prioritize the selection of high-performance materials and low-emission manufacturing processes as part of the detailed studies.

**6.2.2. Positive impacts on the socio-economic environment**





- **Jobs, Workforce Recruitment and Business Opportunities for Small and Medium-Sized Enterprises**

### Impact assessment

The positive impacts will be on job creation and business opportunities for SMEs. This project will be an opportunity for SMEs in the region to win important markets. SMEs specialising in electricity, electromechanics, civil engineering and other trades will be particularly affected, as will be in charge of the development, construction and installation of the teams. In addition, consultants, companies and suppliers will need both skilled and unskilled labour. The positive impacts will mainly be observed on employment and socio-economic activities. During the preparation phase of the project, positive economic benefits are expected for the communities and households affected by the project, in the form of temporary jobs, including unskilled jobs, and opportunities for local traders.

It is estimated that at this phase of the project, the impact on employment, labour recruitment and business opportunities is low to moderate.

### Impact assessment

Jobs, Workforce Recruitment and Business Opportunities for Small and Medium-Sized Enterprises				
Nature of the impact	Intensity	Duration	Extent	Consequence
Positive	Weak	Short-term	Regional	Average

### Enhancement measures

- The enhancement measure consists of recommending compliance with recruitment procedures, avoiding possible discrimination and avoiding political influence in the process.
- Local economic development through small businesses and the creation of small income-generating activities
- **Local economic development through small businesses and the creation of small income-generating activities**

### Impact assessment

The performance of the services of consultants and suppliers will constitute a period of opportunities to mobilize local staff and traders through the sale of food or other products to workers that can generate income for the actors. The affluence that the project will generate will be favourable for the development of small businesses and other economic activities. At this stage of project preparation, the impact will be small, but it foreshadows its magnitude for future phases.



### Impact assessment

Local economic development through small businesses and the creation of small income-generating activities				
Nature of the impact	Intensity	Duration	Extent	Consequence
Positive	Average	Short-term	Site/local level	Average

### Enhancement measures

- Create a line of credit to provide technical and financial support to economic actors
- Improving exchanges of electricity exchanges in the interconnected grid of the WAPP and in member countries

### Impact assessment

The finalization of the synchronization of the electricity grids will increase greater fluidity and reliability in the transmission of electrical energy in the interconnected grid of the WAPP and thus increase the possibilities of energy exchange in the sub-region and thus increase the availability and access of the population to electrical energy. The conditions will thus be met for the operationalization of the regional electricity market, which offers full availability of electricity to meet the needs of populations and businesses, thus auguring a better future of development in the sub-region.

### Impact assessment

Improving exchanges of electricity exchanges in the interconnected grid of the WAPP and in member countries				
Nature of the impact	Intensity	Duration	Extent	Consequence
Positive	Average	Long-term	Regional	Strong

### Enhancement measures

- Developing medium-sized networks in order to strengthen distribution in urban areas
- Increasing Access to Electrical Power for Economic Development in the West African Sub-Region
- ❖ **Increasing access to electrical energy for economic development in the West African sub-region through the availability and reliability of electricity**

### Impact assessment



Strengthening the transmission system and the reliability of electricity grids through system synchronization will create better investment opportunities and thus create new jobs in several sectors. Indeed, meeting the high demand for energy will be the main expectation of populations and businesses. The hope of a substantial and regular supply of energy will make it possible to benefit the basic social infrastructures that have significant energy needs to satisfy the populations. This is the creation of new opportunities for rural and urban electrification, which would generate many positive impacts in the long term.

### Impact assessment

Increasing Access to Electrical Power for Economic Development in the West African Sub-Region through the Availability and Reliability of Electricity				
Nature of the impact	Intensity	Duration	Extent	Consequence
Positive	Strong	Long-term	Regional	Strong

## 6.3. Potential Negative Impacts

### 6.3.1. Negative impacts on the physical environment

- **Impacts on the ground (Alteration of geotechnical properties)**

### Impact assessment

The preparation activities of the BESS project will not significantly affect the soil in terms of relief, geology and texture. However, oils and fuels for machinery will be present on the construction sites. These products and liquid wastes, if handled and stored carelessly, could lead to runoff into the soil and lead to soil contamination. Fortunately, the degree of disturbance to these activities will be low as the integrity of the soil will be minimally and temporarily affected.

### Impact assessment

Impacts on the ground				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Weak	Short-term	Site/local level	Weak



### Mitigation measures

Impacts on the soil can be summed up as deformation by work and pollution of the soil by liquid waste. To ensure phased implementation, it is important that the Consultant in charge of the Environmental and Social Impact Assessment develops an Environmental and Social Management Plan that recommends appropriate measures to mitigate the impact. It may recommend:

Develop a traffic and movement plan and limit the movement of machinery and vehicles outside work areas;

Limit work during extreme weather events (heavy rain, strong winds, etc.).

- **Alteration of air quality and noise pollution**

### Impact assessment

The emission of dust, air pollutants and noise is generally associated with the preparation phase by exhaust gases from machinery in use and by dust stirring up from the circulation of consultants' or suppliers' rolling stock, in particular on unpaved or unpaved roads. Although their dispersion is generally limited, dust, air pollutants and noise can cause nuisance to people in the vicinity of workplaces.

### Impact assessment

Alteration of air quality and noise pollution				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Weak	Short-term	Site/local level	Weak

### Mitigation measures

Care should be taken to:

- The development of general requirements for exposure to sound levels
- Limiting the speed of vehicles on the supply route;
- The possible watering of unpaved tracks in the crossing of neighbouring villages;
- The technical inspection of vehicles and machinery attesting to compliance with the standards in force.
- Workers' health and safety, including a code of conduct;

- **Alteration of water quality**



Surface water impacts refer to the contamination of surface waters by solids and liquid wastes. Indeed, the maintenance of vehicles and machinery associated with the installation of equipment in substations can lead to the handling of liquid products in bulk or stored such as fuel and motor oils and lubricants. If appropriate measures are not taken or envisaged, they may be accidentally spilled and/or washed away by runoff water to contaminate soil or large areas.

### Impact assessment

The preparation activities of the BESS project will not significantly affect the soil in terms of relief, geology and texture. However, oils and fuels for machinery will be present on the construction sites. These products and liquid wastes, if handled and stored carelessly, could lead to runoff into the soil and lead to soil contamination. Fortunately, the degree of disruption to these activities will be low as the integrity of the component will be minimally and temporarily affected.

### Impact assessment

Alteration of water quality				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Weak	Short-term	Site/local level	Weak

### Mitigation measures

To ensure that appropriate measures are taken at this stage to mitigate the impact, it is important to recommend that the Consultant in charge of the environmental and social impact assessment draw up an environmental and social management plan that instructs the said measures. It will be recommended to:

- **Develop, adopt and implement an Environmental and Social Management Plan (ESMP)**
  - Develop, adopt, disclose and implement a plan for the care and maintenance of rolling stock
  - Develop, adopt, disseminate and implement a Hygiene, Health and Environment Plan

#### 6.3.2. Negative impacts on the human environment

- **Risk of alteration of the living environment (various nuisances)**



During construction or during operation, the increase in traffic can lead to the production of dust, atmospheric gases and various nuisances.

- **Solid Waste Emission**

These waste emissions are made up of various materials (rubble, excavated material, plastic packaging products, and polluting materials such as the anarchic discharge of polluted wastewater from sanitary facilities, etc.).

**Impact assessment**

Risk of alteration of the living environment (emission of waste and hazardous materials, uncontrolled discharge of polluted wastewater,				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Weak	Short-term	Regional	Average

**Mitigation measures**

To ensure that appropriate measures are taken to mitigate the impact at this stage, it is important to carry out the ESIA and in addition:

Develop, adopt and implement an Environmental and Social Management Plan (ESMP)

Develop, adopt, disclose and implement a waste and hazardous materials management plan

Develop, adopt, disclose and implement a plan for the care and maintenance of rolling stock

Develop, adopt, disseminate and implement a Hygiene, Health and Environment Plan

- **Risks of protest at the temporary occupation of estates due to study investigations**



### Impact assessment

It may happen that during studies and especially during field work, there is opposition from property owners who would express their refusal to allow consultants to carry out geological or geotechnical investigations or analyses on their property. This unexpected situation if a solution is not found could hinder the quality of the studies.

### Impact assessment

Risks of protest to the temporary occupation of domains during study investigations				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Weak	Short-term	Regional	Average

### Mitigation measures

The main actions to be taken are:

- Develop, adopt, disclose and implement a fair and transparent selection process for consultants in a spirit of transparency
- Develop, adopt, disclose and implement a Stakeholder Engagement Plan (PPMP)
- Develop, adopt, disclose and implement a Complaints Management Mechanism (CMM)
- Elaborate with clarity, precision and consistency in the terms of reference,
  - **Risk of marginalization of vulnerable groups, including discrimination against women in the labour recruitment process**

### Impact assessment

The underestimation of vulnerable people (women, people with disabilities, migrant workers) can manifest itself at the level of the recruitment process and even in the professional field. They are also often discriminated against and unequal in the treatment of workers on the basis of, inter alia, nationality, gender or belonging to other regions unrelated to the needs inherent in the job concerned. Vulnerable groups suffer from the lack of access to information and work.



### Impact assessment

Risk of marginalization of vulnerable groups, including discrimination against women in the labour recruitment process				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Average	Short-term	Regional	Average

### Mitigation measures

Need to develop, adopt, disseminate and implement the following instruments:

- The Stakeholder Engagement Plan (PMPP),
- The Complaints Management Mechanism (CMM),
- The Workforce Management Plan (MPP),
- The Work Management Plan (WMP)
- **Increased complaints, frustration and conflict**

### Impact assessment

The beginning of the implementation of project activities can be marked by a lack of communication and lead to an upsurge of complaints, disputes and marked frustrations. In addition, there are complaints resulting from various irregularities and impartiality in the recruitment process, abuse of power and authority, disturbance of morals, delinquency, etc.

Poor recruitment practices characterized by non-compliance with legislation and labour standards added to the risk of discrimination based on gender (women, vulnerable individuals and groups, etc.) are likely to discredit the project and subsequently generate frustrations that can lead to blockages of activities.

### Impact assessment

Increased complaints, frustration and conflict				
Nature of the impact	Intensity	Duration	Extent	Consequence





Negative	Average	Short-term	Regional	Average
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### Mitigation measures

Need to develop, adopt, disseminate and implement the following instruments:

- The Stakeholder Engagement Plan (PMPP),
- The Complaints Management Mechanism (CMM),
- The Workforce Management Plan (MPP),
- The Work Management Plan (WMP).
- **Emission of Waste and Hazardous Materials**

### Impact assessment

Accidental spillage and leakage of electrolytes from storage batteries are sources of danger to the environment and to humans. The performance of consultants' and suppliers' services, as well as the installation of equipment and materials in the substations for the finalization of synchronization, can be sources of waste generation. These include solid waste from singing, anarchic solid and liquid discharges from construction sites such as packaging waste, household solid waste produced by manual workers, wastewater from sanitary facilities, washing of machinery and runoff on the site and other (rubble and spoil from site preparation, excavations, engine drain oils, used oils), among others.

All these wastes are elements of pollution of the physical and natural environment by the generation of waste or of accidental leakage of oil or hydrocarbons by the generation of both solid and liquid wastes, among which a distinction can be made between hazardous and non-hazardous wastes with risks of improper disposal of the waste. In the absence of an adequate management system, this waste can become a source of unhealthiness, insecurity and disease.

### Impact assessment

Emission of Waste and Hazardous Materials				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Weak	Short-term	Regional	Average

### Mitigation measures



To ensure that appropriate measures are taken at this stage to mitigate the impact, it is important to recommend that the Consultant in charge of the Environmental and Social Impact Assessment Develop, adopt and implement an Environmental and Social Management Plan (ESMP)  
 Develop, adopt, disclose and implement a waste and hazardous materials management plan  
 Develop, adopt, disclose and implement a plan for the care and maintenance of rolling stock  
 Develop, adopt, disseminate and implement a Hygiene, Health and Environment Plan

- **Accident risks for manual workers during the construction and operation phase**

**Impact assessment**

During the implementation of activities, the risk of accidents can be summed up as the risks of traffic accidents, electrocution, handling accidents, fire, explosion, etc. These are the risks of accidents that can lead to bodily injury or even death. There are also risks of exposing workers to hazardous substances, including paints, solvents, risks of irritability of the eyes, etc. The health risks are not ignored with regard to the contamination and spread of STDs, including Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) in the case of risky sexual behaviour. The frequency of incidents and accidents at work depends on compliance with the health, safety and health plan developed on the site. This is why it will have to implement a Health, Safety and Health (HSS) plan for the protection not only of its workers, but also of the local populations. Again, it all comes down to compliance with standards by companies, which is why compliance with specific environmental and social requirements by companies is of great importance.

**Impact assessment**

Accident risks for manual workers during the preparation phase				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Average	Short-term	Regional	Strong

**Mitigation measures**

Need to develop, adopt, disseminate and implement the following instruments:

- Traffic and Travel Management Plan



- The Community Health and Safety Plan
  - The Health, Safety and Environment (HSES) Plan
  - The Stakeholder Engagement Plan (PMPP),
  - The Complaints Management Mechanism (CMM),
  - The Workforce Management Plan (MPP),
  - The Work Management Plan (WMP)
- **Risks of accidents for the population during the preparation phase**

**Impact assessment**

The implementation of the activities could be a source of accidents with vulnerable populations who were not used to them. A distinction can be made between traffic accidents, risks of exposure of the population to dangerous substances, in particular paints, solvents, risks of irritability, electrocution, handling accidents, fire, burns and explosions.

**Impact assessment**

Risks of accidents for the population during the preparation phase				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Average	Short-term	Regional	Strong



## Mitigation measures

Need to develop, adopt, disseminate and implement the following instruments:

- Traffic and Travel Management Plan
  - The Community Health and Safety Plan
  - The Health, Safety and Environment Plan for the construction site
  - The Stakeholder Engagement Plan (PMPP),
  - The Complaints Management Mechanism (CMM),
  - The Workforce Management Plan (MPP),
  - The Work Management Plan (WMP)
- **Resurgence of infection and spread of STIs, HIV/AIDS and COVID-19**

## Impact assessment

The lack of health education for staff using the sanitary facilities and a lack of supervision and maintenance lead to hygiene problems, which are sources of discomfort and the development of diseases. The establishment of appropriate facilities from the beginning of the work, their constant monitoring and maintenance, as well as the awareness of users, are the conditions to be met for the well-being and health of staff and communities

In addition, the high purchasing power of non-native workers associated with the preparation activities of the BESS project could encourage them to develop deviant attitudes with or towards local communities. rape, gangsterism, etc. This could lead to the risk of spreading sexually transmitted diseases (STDs), including HIV/AIDS

## Impact assessment

Resurgence of infection and spread of STIs, HIV/AIDS and COVID-19				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Average	Short-term	Regional	Strong

## Mitigation measures



Need to develop, adopt, disseminate and implement the following instruments:

- The Stakeholder Engagement Plan (PMPP),
- The Health, Safety and Environment (PHSSE) plan
- The Complaints Management Mechanism (CMM),
- The Workforce Management Plan (MPP),
- The Work Management Plan (WMP)

❖ **Risk of thermal runaway due to energy loss from battery storage and discharge**

**Impact assessment**

During the storage of electrical energy in the battery system and during the discharge and use of the stored energy, there could be a loss of stored electrical energy no matter how small the proportion. The permanence of this loss, combined with the large number of batteries in service, could lead to an overheating of the room housing the batteries and even outside the room by means of the "joule effect". This overheating can lead to excessive heat elevations that can be measured by the ambient temperature.

This continuous overheating of the room and the batteries is a factor favourable to the explosion of the batteries and the occurrence of fire. Regular monitoring of temperature checks and readings is required.

Risk of thermal runaway fire				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Weak	Permanent	Regional	Strong

**Mitigation measures**

- Avoid mixed storage with other products that can accelerate a fire,
- The storage area must be monitored by an appropriate fire alarm system and connected to permanent monitoring,
- Have an automatic and appropriate extinguishing system
- Regular check and update of fire protection.



## Fire Prevention Measure

### 1. Passive/Preventive Protection :

- Flame retardants: Add flame retardant materials to improve the thermal stability of batteries.
- Flame retardant compartments: Use special enclosures to protect batteries from fire.
- Battery Management System (BMS) monitoring: The BMS monitors the status of batteries and can detect anomalies.

### 2. Detection Technologies:

- Gas and particle detection: Monitor emissions of potentially hazardous gases or particles.
- Heat Detection: Detect abnormal temperature rises.
- Smoke detection: Identify the presence of smoke.
- Flame Detection: Detect flames in the event of a fire.

### 3. Regular maintenance:

- Inspect and maintain batteries regularly to prevent hazards.

## Risk of explosion and fire

### Impact assessment

The instructions for use of the Lithium-ion battery are subject to a "Safety Data Sheet" from the battery manufacturer that provides initial guidance. The dangers associated with lithium batteries are multiple: electrical risk, fire risk, environmental risk, acid leakage, etc. When the risks are related to lithium batteries, an examination of the entire process in the company from the receipt of the goods to its production and the storage of waste is carried out to avoid external spread. Thus, one of the best methods for fire protection is teamwork, which consists of bringing together the manufacturers of the secure storage solutions, the employees concerned, managers, fire protection officers, representatives of the insurance company, firefighters and experts. To ensure the effectiveness of the fire protection, it should be checked regularly and, if necessary, updated.

Fire Hazard				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Average	Short-term	Regional	Strong



## Mitigation measures

- Avoid mixed storage with other products that can accelerate a fire,
- The storage area must be monitored by an appropriate fire alarm system and connected to permanent monitoring,
- Have an automatic and appropriate extinguishing system
- Storage in separate fireproof areas or storage at a safe distance (5 m spatial separation)
- Regular check and update of fire protection.

## Fire Prevention Measure

### 4. Passive/Preventive Protection :

- Flame retardants: Add flame retardant materials to improve the thermal stability of batteries.
- Flame retardant compartments: Use special enclosures to protect batteries from fire.
- Battery Management System (BMS) monitoring: The BMS monitors the status of batteries and can detect anomalies.

### 5. Detection Technologies:

- Gas and particle detection: Monitor emissions of potentially hazardous gases or particles.
- Heat Detection: Detect abnormal temperature rises.
- Smoke detection: Identify the presence of smoke.
- Flame Detection: Detect flames in the event of a fire.

### 6. Regular maintenance:

- Inspect and maintain batteries regularly to prevent hazards.

## Arrangements for transportation

Lithium batteries are assigned UN 3090/3091 (lithium-metal batteries) and UN 3480/3481 (lithium-ion batteries) as dangerous goods of Class 9. This means that lithium-ion batteries are subject to dangerous goods regulations during transport and special requirements must be met for transport packaging.

### General rules :

- Use transport packaging with UN approval for the transport of lithium-ion batteries by road, rail, ship or air;



- Depending on the condition of the lithium-ion batteries, the transport case must also have an appropriate approval and comply with certain packing instructions according to REA(European Agreement concerning the International Carriage of Dangerous Goods by Road)

In accordance with the legislation, the following are used:

- Flame retardants (PyroBubbles granules) as a crate filling material and act as an extinguishing agent as they are tested according to the EN3-7 standard for solid and liquid combustible materials.
- Expanded glass granules that are poured into the crate or introduced in the form of filler cushions
- Textured fiberglass flame retardant absorbent material

❖ **Influx of job-seeking labour**

**Impact assessment**

The start of the project's preparation activities will be a source of attraction for everyone: shopkeepers and job seekers. This influx of people becomes more important as soon as the first recruitments take place, leading to an increase in the need for resources such as water, access to health care, electricity, etc. The massive influx of these people into the social environment can be a source of social change, namely the creation of relationships, intimacy and/or conflictual relationships, especially if the natives were not informed in advance. In the absence of preventive communication and awareness-raising at the start of the work, many conflicts could emerge if the newcomers do not also take care to respect the prohibitions, habits and customs established on the land.

**Impact assessment**

Influx of job-seeking labour				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Average	Short-term	Regional	Average

**Mitigation measures**





Need to develop, adopt, disseminate and implement the following instruments:

- The Stakeholder Engagement Plan (PMPP),
- The Health, Safety and Environment (PHSSE) plan
- The Complaints Management Mechanism (CMM),
- The Workforce Management Plan (MPP),
- The Work Management Plan (WMP)

### Risks of weakening local structures guaranteeing "traditional rights" and disruption of social cohesion

#### Impact Assessment:

Initial social cohesion could be put to the test with the massive influx of non-natives. These individuals may be led to refuse to respect existing prohibitions and to create an uncontrollable social climate. This cosmopolitanism leads to the erosion of the powers of the customary authorities, the development of attitudes of insubordination of citizens towards the local and customary authorities of the localités. et establish the depravity of morals. These attitudes, which in fact destroy existing social cohesion, end up disturbing the tranquillity of the population.

Complaints and conflicts could become numerous and recurrent in the following situations:

- The destabilization of households: adulterous situation with the possibility of disturbance or even separation in households;
- The development of prostitution with the possibility of transmission of STDs and HIV/AIDS
- The development of delinquency and insecurity;
- Pressure on land and natural resources: due to the occupation of land by immigrants, increased competition for the exploitation of local natural resources through hunting, poaching and fishing or the collection of firewood;
- The development of teenage pregnancies and juvenile delinquency in the area;
- The amplification of inappropriate behaviour of immigrants towards patriarchs, heads of households, village chiefs and the population.

#### Impact assessment

Risks of weakening local structures guaranteeing "traditional rights" and disruption of social cohesion				
Nature of the impact	Intensity	Duration	Extent	Consequence



Negative	Average	Short-term	Regional	Average
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### Mitigation measures

Need to develop, adopt, disseminate and implement the following instruments:

- The Stakeholder Engagement Plan (PMPP),
- The Complaints Management Mechanism (CMM),
- The Workforce Management Plan (MPP),
- The Health, Safety and Environment (PHSSE) plan
- The Work Management Plan (WMP)

### ❖ Risk of increased sexual exploitation and abuse and sexual harassment (SEA/HS)

### Impact assessment

As the influx of people becomes more and more important, the security arrangements are no longer able to contain the actions of one or the other. As a result, there is a lack of respect for the morals and customs of the populations and for human relations in general. Thus, individuals manage to defy prohibitions and commit misdemeanor or sometimes criminal acts related to gender. These deviant behaviours include pimping, sexual harassment, sexual exploitation and abuse and sexual violence against women, men, paedophilia, any act of pimping, sexual harassment, sexual abuse and exploitation, sexual violence, paedophilia, paedophilia, etc.

### Impact assessment

Risk of increased sexual exploitation and abuse and sexual harassment (SEA/HS)				
Nature of the impact	Intensity	Duration	Extent	Consequence
Negative	Average	Short-term	Regional	Average

### Mitigation measures

Need to develop, adopt, disseminate and implement the following instruments:

- The Stakeholder Engagement Plan (PMPP),
- The Complaints Management Mechanism (CMM),
- The Workforce Management Plan (MPP),



- The Health, Safety and Environment (PHSSE) plan
- The Work Management Plan (WMP)

#### 6.4. Summary of potential impacts

Energy storage in batteries is an evolving field, with pros and cons to consider. Here is a summary of the positive and negative impacts associated with the project.

##### 1st. Potential positive impacts :

1. **Increasing renewable energy production in the energy mix**
2. **Storage of renewable energy for later use as a replacement for polluting energy**
3. **Increased flexibility and reliability of the power grid**
4. **Stabilization of the power grid** : Batteries can store the energy produced during periods of low demand and release it when demand is higher. This helps balance the grid and prevent power outages. This contributes to better power grid development planning.
5. **Enhanced energy self-sufficiency** : This energy storage system is renewable and allows users to store locally produced electricity for later use. This can make communities more energy self-sufficient.
6. **Better Power Grid Development Planning**
7. **Reduction of CO2 and greenhouse gas (GHG) emissions through more polluting equivalent production**
8. **Jobs, Workforce Recruitment and Business Opportunities for Small and Medium-Sized Enterprises**
9. **Local economic development through small businesses and the creation of small income-generating activities**
10. **Increasing access to electrical energy for economic development in the West African sub-region through the availability and reliability of electricity**

##### 2nd. Potential Negative Impacts :

11. **Increased complaints, frustration and land conflicts during land mobilization**
12. **Alteration of soil, air and water quality during deconstruction work**
13. **Risk of alteration of the living environment (various nuisances)**
14. **Emission of Waste and Hazardous Materials**
15. **Accident risks for manual workers during the construction and operation phase**
16. **Risk of thermal runaway due to energy loss from battery storage and discharge**
17. **Risk of explosion and fire due to battery failure.**



**Limited battery life** : Batteries have a limited lifespan and need to be replaced after a certain number of charge and discharge cycles. Recycling used batteries is also a challenge.

**Safety Hazards** : Batteries can pose fire or explosion hazards, especially if they are improperly maintained or damaged

In summary, battery energy storage offers significant benefits in terms of the sustainability and flexibility of the power grid, but it is essential to manage the associated environmental and safety impacts.

**Table 7: summary of impacts and improvement measure**



Designation of Impact	Intensity	Duration	Extent	Importance	Mitigation or Enhancement Measure
<b>Potential Positive Impacts</b>					<b>Enhancement Measures</b>
Employment, Workforce Recruitment, and Business Opportunities	Low	Short-term	Regional	Medium	Implement, adopt, disclose, and apply the ESIA, ESMP. Ensure adherence to recruitment procedures to avoid any possible discrimination and political influence in the process.
Local Economic Development Through Creation of Small Income-Generating Activities	Low	Short term	Local	Low	Create a credit line to technically and financially strengthen economic actors.
Improvement of Electrical Energy Exchange in the WAPP Interconnected Network	Medium	Long term	Regional	Strong	Develop networks to enhance distribution in urban areas
Increase in Access to Electrical Energy for Economic Development in the West African Sub-region	Medium	Long term	Regional	Strong	Enhancement measures: Develop networks to strengthen distribution in urban areas.
Potential for Reduction of CO2 Emissions and Greenhouse Gases (GHG) and Impact on Climate Change Due to Network Synchronization	Medium	Long term	Regional	Strong	Implement, adopt, disclose, and apply the ESIA, ESMP. To maximize this reduction of greenhouse gas emissions, it would be beneficial to promote further production of renewable energies and encourage ongoing projects to prefer the selection of high-performance materials and low-emission manufacturing processes in detailed studies.
<b>Impacts négatifs potentiels</b>					<b>Mesures d'atténuation</b>



Impacts on Soil (Alteration of Physical Characteristics, Erosion, Compaction, and Contamination from Solid and/or Liquid Wastes)	Low	Short term	Local	Low	<ul style="list-style-type: none"> <li>- Develop a traffic and movement plan and limit the movement of machinery and vehicles outside work areas;</li> <li>- Limit works during extreme weather events (heavy rains, strong winds, etc.).</li> </ul>
Alteration of Air Quality and Noise Nuisance	Low	Short term	Local	Low	<ul style="list-style-type: none"> <li>- Develop general prescriptions regarding exposure to noise levels; Limit vehicle speeds on supply routes;</li> <li>- Adopt possible watering of unpaved tracks in neighboring villages;</li> <li>- Apply vehicle and machinery technical control attesting to compliance with current standards;</li> <li>- Develop a worker health and safety plan, including a code of conduct.</li> </ul>
Alteration of Water Resource Quality	Low	Short term	Local	Low	<p>Implement, adopt, disclose, and apply:</p> <ul style="list-style-type: none"> <li>▪ the ESIA,</li> <li>▪ ESMP;</li> <li>▪ a maintenance plan for rolling stock;</li> <li>▪ a Hygiene, Health, Environment plan.</li> </ul>
Risks of Alteration of Living Environment (Emission of Wastes and Hazardous Materials, Anarchic Discharges of Polluted Wastewater)	Low	Short term	Local	Low	<p>Develop, adopt, and implement:</p> <ul style="list-style-type: none"> <li>▪ an Environmental and Social Management Plan (ESMP);</li> <li>▪ a maintenance plan for rolling stock;</li> <li>▪ a Hygiene, Health, Environment plan.</li> </ul>
Risk of Exclusion, Favoritism, and Discrimination in the Selection and Designation Processes of Project Team Members	Medium	Short term	Local	Medium	<p>Develop, adopt, disclose, and implement a procedure for designating representatives and project team members;</p> <p>Develop, adopt, disclose, and implement a fair and transparent consultant selection procedure in a spirit of transparency;</p> <p>Develop, adopt, disclose, and implement a Stakeholder Mobilization Plan (SMP);</p>



					Develop, adopt, disclose, and implement a Complaint Management Mechanism (CMM).
Risk of Protests Due to Temporary Occupation of Lands for Study Investigations	Medium	Short term	Local	Medium	Develop, adopt, disclose, and implement: <ul style="list-style-type: none"> <li>- the Stakeholder Mobilization Plan (SMP);</li> <li>- the Complaint Management Mechanism (CMM);</li> <li>- the Workforce Management Plan (WMP);</li> <li>- the Work Management Plan (WMP).</li> </ul> Avoid changes to project sites or areas while services are ongoing. Engage in clear and precise terms of reference on the definition of tasks. Maximize avoidance of changes in consultant team experts; retain consultants proficient in both English and French.
Risks of Inaccurate Definitions of Environmental and Social Impacts and Poor Quality of Study Results	Medium	Short term	Local	Medium	Develop, adopt, disclose, and implement: <ul style="list-style-type: none"> <li>- a good monitoring plan for the realization of studies;</li> <li>- good precision and consistency in terms of reference;</li> <li>- a Stakeholder Mobilization Plan (SMP);</li> <li>- a Complaint Management Mechanism (CMM)</li> </ul>
Resurgence of Conflicts with Consultants	Medium	Short term	Local	Medium	Develop, adopt, disclose, and implement <ul style="list-style-type: none"> <li>- the Stakeholder Mobilization Plan (SMP),</li> <li>- the Complaint Management Mechanism (CMM),</li> <li>- the Workforce Management Plan (WMP),</li> <li>- and the Work Management Plan (WMP).</li> </ul> Avoid changes to project sites or areas while services are ongoing. Engage clear and precise terms of reference on the definition of tasks. Maximize avoidance of changes in consultant team experts; retain consultants proficient in both English and French.
Risk of Marginalization of Vulnerable Groups, Particularly Discrimination	Medium	Court terme	Regional	Strong	Develop, adopt, disclose, and implement the following instruments: SMP, CMM, WMP, and WMP.



Against Women in the Workforce Recruitment Process					
Resurgence of Complaints, Frustration, and Conflicts	Medium	Short term	Regional	Strong	- Develop, adopt, disclose, and implement the SMP, CMM, WMP, and WMP
Risk of Disruption in the Supply of Electrical Energy Affecting Businesses	Low	Short term	Regional	Medium	- Develop, adopt, disclose, and implement the SMP, CMM, WMP, and WMP.
Emission of Waste and Hazardous Materials	Medium	Short term	Local	Medium	Develop, adopt, and implement : - an Environmental and Social Management Plan (ESMP), - a management plan for residual and hazardous materials, - a maintenance and upkeep plan for rolling stock, - and a Hygiene, Health, and Environment plan
Risk of Accidents to Workers During Synchronization Works	Medium	Short term	Regional	Strong	Develop, adopt, disclose, and implement the SMP, CMM, a traffic and movement management plan, the Hygiene, Health, Safety, and Environment (HHSE) plan, the WMP, and the WMP.
Risk of Accidents to the Population During the Preparation Phase	Medium	Short term	Regional	Strong	Develop, adopt, disclose, and implement the SMP, CMM, a traffic and movement management plan, the HHSE plan, the WMP, and the WMP.
Resurgence of Contamination and Spread of STIs, HIV/AIDS, and COVID-19	Medium	Short term	Regional	Strong	Need to develop, adopt, disclose, and implement the following instruments: SMP, the HHSE plan, CMM, WMP, and WMP.
Influx of Workforce Seeking Employment	Medium	Short term	Regional	Medium	Need to develop, adopt, disclose, and implement the following instruments: SMP, the HHSE plan, CMM, WMP, and WMP
Risks of Weakening Local Structures Guaranteeing 'Traditional Rights' and Disruption of Social Cohesion	Medium	Short term	Regional	Medium	Need to develop, adopt, disclose, and implement the following instruments: SMP, CMM, WMP, the HHSE plan, and WMP.





Risk of Exacerbating Exploitative Behaviors and Sexual Abuse and Harassment (SA/SH)	Medium	Short term	Regional	Medium	Need to develop, adopt, disclose, and implement the following instruments: SMP, CMM, WMP, the HHSE plan, and WMP.
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**Table 7 : Summary of impacts and improvement measure**



## 7. Environmental and Social Management Plan

This section of the document provides a summary of the Environmental and Social Management Plan (ESMP) for the preparation phase of the BESS project. First, the actors involved are presented, as well as the institutional arrangements necessary for the effective implementation of the ESMP. The measures that avoid, mitigate, compensate for or enhance the impacts are then detailed. This chapter also outlines the monitoring, follow-up and capacity-building programmes required for the effective implementation of the ESMP. The Stakeholder Engagement Plan (PEPP) for the operational phase is outlined, including the general objectives of the PEPP, the target groups, and suggested communication methods. Finally, the needs in terms of resources and institutional organisation for the implementation of the PEPP are addressed.

This section presents all environmental and social management measures, including technological risk management, and describes the operational and organizational aspects of implementing the recommended environmental protection measures. These measures are divided into two main groups: general measures and specific measures.

General measures are standard measures that apply to the BESS project and/or all activities. The specific measures target certain specific impacts that have been identified and for which specific actions must be implemented.

In addition, management measures include two types of measures: mitigation measures that aim to minimize the effects of the project's negative impacts and enhancement measures that aim to increase the positive impacts.

The set of management measures will be presented in tabular form for each phase of the project, which will also include monitoring indicators, responsibilities, the period of implementation and their cost.

### 7.1. Submission of specific management plans

Specific management plans on specific themes are proposed and integrated into the ESMP according to the nature of the impacts that will be identified during the ESIA stage. Topics may include:

- Stakeholder engagement, including complaint management;



- Workforce Management
- Waste and hazardous materials management;
- Traffic and travel management;
- Emergency preparedness;
- The health and safety of communities;
- Workers' health and safety, including a code of conduct;
- Management of workers' camps;
- The fight against gender-based violence (GBV);

## 7.2. Mitigation and enhancement measures

The impact mitigation measures to avoid, mitigate, compensate for or enhance the various impacts identified are presented in a table called the Environmental and Social Management Plan for the project for the project preparation phase. Those responsible for implementation and monitoring or follow-up are also identified for each activity, along with the associated costs. Indicators for the implementation of the measures are proposed to assess the environmental performance of the ESMP. For more details on monitoring and follow-up, refer to the section below.



### **7.3. Actors to be involved in the implementation of the ESMP, mainly focused on the preparation of the project**

The effective and efficient implementation of the Environmental and Social Management Plan (ESMP) requires an institutional arrangement, a mobilization of stakeholders by clarifying the roles and responsibilities of each of them. The following actors, inter alia, could be worked with to implement the ESMP:

#### **7.3.1. The West African Power Pool (WAPP)**

The WAPP was established by Decision A/DEC.5/12/99 of the 22nd Summit of the ECOWAS Authority of Heads of State and Government. By Decision A/DEC.18/01/06, the 29th ECOWAS Summit of Heads of State and Government, held in Niamey, adopted the Convention on the Organization and Functioning of the WAPP. At the same Summit, the status of ECOWAS Specialized Agency conferred on WAPP, by Decision A/DEC.20/01/06.

The WAPP Secretariat is the administrative and technical body responsible for the day-to-day management of WAPP activities. It is made up of 3 departments, namely: the Information and Coordination Centre (ICC), the Administration and Finance Department and the Department of Planning, Investment Programming and Environmental Safeguards (PIPES)

The PIPES is responsible for the implementation of the WAPP priority projects including ESMP during project preparation phase.

PIPES has a team of experts in technical monitoring and environmental and social monitoring of projects and serves as regional Project Management Unit (PMU).

In terms of role and responsibility, the regional PMU team, with the support of the environmental consultants, the social consultant and the gender consultant, coordinates and monitors all the activities of the project, in this case those of the consultants in charge of carrying out the pre-investment studies. The team reports on the progress of the project activities to the Director of Department and the donor at all project monitoring meetings.

#### **7.3.2. The Department of Planning, Programming of Investments and Environmental Protection (D/PIPES)**

The Department of Planning, Investment Programming and Environmental Protection (D/PIPES) ensures responsibility for the implementation of the project, the project's ESMP in its project preparation phase through its attributions .



D/PIPES has a team of experts for technical monitoring and environmental and social monitoring of projects. Further details are provided in the detailed WAPP BESS budget.

In terms of role and responsibility, the project team with the support of the environmental consultants, the social consultant and the gender consultant coordinates and monitors all project activities, in this case those of the consultants in charge of the carrying out pre-investment studies. The team reports on the progress of project activities to the Department Director and the donor at all project monitoring meetings.

### **7.3.3. Project Management Unit**

This regional Project Management Unit (PMU) is created within the PIPES department to monitor the project on a daily and instantaneous basis. This unit includes the BESS Project Coordinator, an Environmental Consultant, a Social Consultant and a Part-time Gender Consultant. The latter are responsible, each as far as it is concerned, for monitoring the preparation of safeguard instruments (HEIAS, PGES, PZA, PMPP, PGMO, MGP, HSSE, etc.), public consultations as well as monitoring the management of the Complaints Management Mechanism. They track the quality of the content of the backup documents.

### **7.3.4. Ministries in charge of energy**

The ministries in charge of energy of the ECOWAS member countries ensure the proper execution of projects in their sector. In this regard, it is reserved to give guidelines in order to avoid certain difficulties. These ministries have set up Technical Directorates that represent the Ministry in the activities of coordination of the follow-up of the Environmental and Social Management Plan that are carried out by the environmental institutions. As such, they participate in the field activities carried out.

### **7.3.5. Other Ministries Involved**

The Ministries of Finance, Agriculture, Construction, Estates and Urban Planning are involved in the development and implementation of ESMPs as required. They will undoubtedly intervene to one extent or another. This is the case of the Ministry of Agriculture, which participates in the definition of the price list for the compensation of agricultural losses



### 7.3.6. The National Electricity Companies concerned and members of the WAPP

The National Electricity Companies are first and foremost the project leaders on the territory of their country. They designate the management, the department, the technical design services, the environmental services and the focal points for the coordination and monitoring of the execution of the project activities.

Within the framework of the BESS project, the following companies or electricity companies from ECOWAS Member States will benefit from the support of the donor:

### 7.3.7. Project Management Units (PMUs in the countries concerned)

Like the PMU within the region, the PMUs at the national level are composed of teams of technical managers appointed by their superiors to monitor the activities of the project and to suggest recommendations necessary for timely implementation. The national PMU will include but is not limited to:

- Benin: The Benin Electricity Community (CEB) and the Beninese Electric Energy Company (SBEE).
- Togo: Compagnie Energie Electrique du Togo (CEET)
- Many: Many Grid Companies (GRIDCo)
- Nigeria : Transmission Company of Nigeria (Nigeria-TCN)
- Côte d'Ivoire: CI Energie (CI)
- Guinea: Electricité De Guinée (EDG SA)
- Gambie : Electric Company de Gambie
- Burkina Faso: National Electricity Company of Burkina Faso (Burkina Sonabel)
- Mali : Energie du Mali (EDM)
- Niger: Nigerien Electricity Company (NIGELEC)
- Senegal: National Electricity Company of Senegal (Senelec)
- Liberia : Liberia Electricity Corporation (LES)
- Guinée-Bissau : La compagnie nationale d'électricité et de gestion de l'eau (EAGB)

They have facilities that will be used to finalize the synchronization. As owners of these facilities, they will not only be consulted on by the consultants in charge of the project preparation studies, but they will also participate in the implementation of certain arrangements during this phase.



### 7.3.8. Environmental Agencies/Institutions

Environment agencies in all ECOWAS member countries have been set up as agencies or special administrations, most often responsible for environmental management. These Competent Administrations or Agencies (EAAs) are responsible for approving the Impact Assessments of the Projects. They give their advice to the Ministries of the Environment for the issuance of the certificate or permit of compliance and coordinate the follow-up of the Environmental and Social Management Plan. As such, the agencies monitor the proper implementation of mitigation and enhancement measures. They can also mobilize local state representatives in charge of environmental and resettlement issues to support it in its interventions.

### 7.3.9. Independent Power Producers (IPPs) such as Contour Global (Togo), Azura-Edo IPP (Nigeria), Access Power (Mali), AMDA (Burkina Faso).

Independent producers are concerned since they own production facilities on which interventions will be carried out as part of the finalization of the synchronization of electrical substations. They will play their part in the environmental and social management of the project as far as they are concerned.

### 7.3.10. Consultants & Suppliers

Consultants and suppliers are the direct implementers of the project preparation phase. Their actions are at the root of the generation of conflict and frustration. Their services can be summed up in carrying out pre-investment studies in accordance with the rules of the art. It is precisely in compliance with the rules of the art that imperfections are noted, namely: non-compliance with procedures for the recruitment of experts and/or manpower, bad behaviour of elements of their teams towards communities, insufficient sharing of information, negligence in public consultations, etc.

### 7.3.11. Funders

The General Secretariat of the West African Electricity Exchange System is requesting financial support from donors to finance the cost of the BESS Project.

An Environmental and Social Framework (ESF) will come into force to apply to all new financing of the donor's investment projects. It will enable donors and borrowers to better manage the environmental and social risks of projects and achieve better development results.



The ESF addresses environmental and social risks in a thorough and systematic manner; it marks a major shift in the way issues such as transparency, non-discrimination, public participation and accountability ethics are addressed, including by expanding the role of complaints mechanisms; It further harmonizes the environmental and social protection mechanisms of the donor with the project promoters.

It includes the donor's Sustainable Development Vision and the lessor's environmental and social policy on the financing of investment projects.

### 7.3.12. Local authorities

Local authorities and local elected officials (Mayors), traditional chiefs and local customary chiefs of the countries concerned by the country play an important role in mobilizing for the effective management of the ESMP. However, they are undoubtedly consulted in the procedure for the implementation of the various safeguard instruments.

Local authorities are key intermediary actors between the national PMU-WAPP/PMU and the population. In particular, these authorities shall participate in all discussions and negotiations which relate in particular to compensation. They also carry out specific tasks, including those relating to land.

The project preparation documents show that there is a need for certain actors to be and actively participate in the implementation of the ESMP at this stage of project preparation.

### 7.4. Roles and responsibilities of the actors involved

The highlighted actors participate in the implementation of the project because they:

- Participate in the design and/or financing of the project (technical and financial partners, sectoral ministries, local authorities);
- Play a role in the preparation and/or production of project execution documents (technical and financial partners, sectoral partners, local authorities, decentralised public and administrative authorities, regional and departmental technical services of the State;
- Actively participate in consultations to voice concerns on a scale larger than that of a household (Community Base Organization (CBO), Civil Society Organizations (CSOs), Media, etc.) ;





- Receive information due to the fact that public funding is offered in support of this project (populations in general).
- Are actors in the sector of intervention of the project (regional and departmental technical services of the State intervening in the specific field, CSOs, the private sector, the media, etc.);

**Table 8: Institutional arrangement and the roles and responsibilities of actors in the implementation of the project**

Level	Institutional actors	Roles and Responsibilities
WAPP	D/PIPES  PMU	Project Sponsor and Coordinator  Responsible for the preparation of technical feasibility studies and environmental feasibility studies Responsible for the development and monitoring of the implementation of the PMPP, ESMP, MOMP, PMP, PHSSE
National Electricity Companies of the ECOWAS countries involved in the project	PMU national, Focal Points	Follow-up of the execution of the project  Monitoring the implementation of the PPMP, ESMP, MOP, PMM, etc.
Ministry in charge of energy in the ECOWAS countries involved in the Project	Focal Points	Ensure the implementation of the project in accordance with the funding agreement  Support utilities in the diligent processing of files at the level of environmental agencies to obtain feasibility opinions in a timely manner.  Regional and national monitoring and coordination of the implementation of Project activities  Implementation of the PPMP and ESMP  Information and involvement of stakeholders



Level	Institutional actors	Roles and Responsibilities
		<p>Ensuring compliance with stakeholder commitments</p> <p>Management and monitoring of the grievance management mechanism</p> <p>Ensuring that the needs and interests of the population are taken into account</p>
Ministries in charge of Environment in the ECOWAS countries concerned by the Project	Institutions/Administrations/National Environmental Management Agencies	<p>Validate the terms of reference</p> <p>Validate scoping reports, ESIA and RAP reports</p> <p>Monitor the implementation of Environmental and Social Management Plans (ESMP),</p> <p>Organize the public hearing</p>
Other Government Departments	<p>Finances</p> <p>Agriculture</p> <p>Labour and Employment</p> <p>Town planning</p> <p>Gender and Child Promotion</p>	<p>Provision of resources for offsets</p> <p>Timely availability of funds for compensation</p> <p>Monitoring and evaluation of programmes and projects</p> <p>Participation in the definition of the compensation price grid for the assets to be allocated (arable land, crops, plantations and agricultural harvests)</p> <p>Validate Action and Resettlement Plans</p> <p>Preparing the declaration of public utility</p> <p>Monitoring and adoption of the content of the PGMO (compliance with labour regulations)</p> <p>Follow-up and adoption of hygiene, health, safety and working conditions plans</p> <p>Monitoring of social issues and issues relating to gender-based violence and child labour.</p>



Level	Institutional actors	Roles and Responsibilities
Private Power Generation and Transmission Sector	Construction companies	<p>Execution of the work</p> <p>Elaboration of a PGES of the works,</p> <p>Implementation of a labour code and a staff code of conduct,</p> <p>Respect for the principle of personal protection of workers</p> <p>etc.</p>
Consultants & Suppliers	<p>Technical Studies Consultants</p> <p>Supervision and Control Consultants</p>	<p>Monitoring the implementation of the ESMP and PPMP</p>
Territory Administration	<p>Local elected officials</p> <p>Technical Services of Regional Councils</p>	<p>Participation in the local follow-up of the PMPP and the PGES, the PGMO, MGP, etc. Environmental &amp; Social</p> <p>Establishment and animation of the Complaints Management Mechanism</p> <p>Mobilization, information and awareness-raising of local communities</p>
Local Chiefdom	Neighborhood or village leaders	<p>Establishment and animation of the Complaints Management Mechanism</p> <p>Mobilization, information and awareness-raising of local communities</p>
Lessor	GIZ	<p>External monitoring, evaluation and audit of implementation</p> <p>Financial support</p> <p>Supervision of project activities, including environmental and social activities</p> <p>Guarantor of stakeholder participation</p>



**Table 8 : Institutional arrangement and the roles and responsibilities of actors in the implementation of the project**

## 7.5. Environmental and Social Management Framework (ESMF)

### Technical Procedures for Environmental and Social Management of Project Implementation

The Environmental and Social Management Framework (ESMF) presents key axes for the environmental and social management of the project, taking into account the requirements of the environmental regulations of the ECOWAS member country and the operational policies of the World Bank. The ESMF will be included in the BESS Project implementation manual. The selection of sites for BESS projects will undergo an initial "screening" by the approval committee involving representatives from environmental institutions, local communities, and Environmental Safeguard and Social Development Specialists from the PMUs. Notwithstanding the due diligence required in the ESIA and regarding the conservation of the biophysical and functional characteristics of the project's receiving environment, no physical investment will be supported by the project unless it:

- Involves risks of degradation to sensitive ecosystems such as classified forests, waterway banks, sacred forests, rivers, etc.
- Involves risks of elimination of ecosystem services;
- Is inconsistent with the laws, national regulations, and in line with the requirements of the World Bank.

### 7.5.1. Methodology for the Preparation, Approval, and Implementation of BESS Projects

#### 1) Technical Procedures for Environmental and Social Management of Project Implementation

To integrate environmental and social dimensions during the design and execution of BESS sub-projects, it is crucial to propose an environmental and social approach that assesses impacts and describes at each stage of the sub-project the environmental and social measures to be implemented and the actors responsible for them. Indeed, it will determine the level and modalities of considering environmental and social impacts in the sub-project cycle by specifying from the outset the environmental and social work to be carried out and to contain negative impacts. Furthermore, the proposed approach will take into account existing environmental and social management in the administrative procedure for assessing and reviewing impacts on the physical



and social environment in the concerned countries. Thus, this section of the present ESMF addresses the mechanisms for classifying and assessing projects.

## 2) Process and Stages of Environmental Selection of Sub-projects

The selection process aims to:

- (i) determine which Project activities are likely to have negative impacts including land acquisition;
- (ii) determine appropriate mitigation measures for activities with detrimental impacts;
- (iii) identify activities requiring separate ESIA;
- (iv) describe the institutional responsibilities for approving the selection results, implementing proposed measures,
- (v) and monitoring the measures. This environmental and social selection (or screening) process will include the following stages:

**Preliminary stage: choice of BESS project site and activities to be carried out:** This stage takes place during the preparation of the project notice. It is carried out under the responsibility of the focal points of the technical Ministries concerned with the activity in connection with the PMU and regional technical services.

The environmental and social assessment of the BESS project involves identifying, describing, and characterizing the potential positive and negative environmental and social impacts likely to be generated before implementation, during the construction phase, and during the operational or effective implementation phase of the sub-project. Each sub-project then requires a prior environmental and social review to determine the type of socio-environmental assessment instruments that, if necessary, should be used in the context of the project, considering the types of activities planned. The same applies to the socio-environmental assessment instruments that will be used. The World Bank, in accordance with Standard 1 of the Environmental and Social Standards (ESS), classifies sub-projects into three categories:

- Category A: Project with certain major environmental and social risks;
- Category B: Project with moderate and reversible environmental and social risks or possible major (or minor cumulative risks from multiple sub-projects) but manageable;



- Category C: Project with no significant impacts on the environment.

It should be noted or recalled that the environmental legislation of each ECOWAS country has established an environmental classification of projects into three categories:

- **Very high risk:** investments/sub-projects are likely to have significant impacts on the environment. This category requires a thorough environmental assessment accompanied by an Environmental and Social Management Plan (ESMP). Moreover, in case of physical or economic displacement, the ESIA/ESMP will be complemented by a Resettlement Action Plan (RAP). Under national regulations, these sub-projects require a detailed impact study, accompanied if necessary by a Resettlement Action Plan.
- **Substantial risk:** investments/sub-projects presenting significant but reversible environmental and social impacts and risks based on the implementation of avoidance and/or mitigation measures. A thorough study of the impacts will be necessary to assess the impacts and propose management measures. Moreover, in case of physical or economic displacement, the ESIA/ESMP will be complemented by a Resettlement Action Plan (RAP). Under national regulations, these projects are subject to authorization and require a detailed impact study, accompanied if necessary by a Resettlement Action Plan;
- **Moderate risk:** investments/sub-projects have limited impacts on the environment, or impacts can be mitigated by applying measures or changes in their design. Under national regulations, these sub-projects may have easily identifiable and limited impacts, and the means of their mitigation are generally known. These projects are subject to Simplified Environmental and Social Impact Study or Environmental and Social Impact Notice (ESIN);
- **Low risk:** investments/sub-projects that do not require an environmental and social study. In terms of national legislation, this category of low-risk sub-projects and the negative impacts are minor. They are subject to environmental and social prescriptions.

The environmental and social selection process will include the following steps:

- **Step 1: Identification, Environmental and Social Selection, and Classification of the Sub-project**



The first step of the selection process focuses on the identification and classification of the activity to be carried out under the BESS Project, to assess its effects on the environment. The results will indicate: potential environmental and social impacts, the needs for mitigation of nuisances, and the type of public consultations that have been conducted during the selection exercise. The selection and classification will be performed by the Project Management Unit (PMU).

The provisional results of the selection may or may not be sent to national institutions in charge of environmental management for approval. Project activities classified as "B" will require environmental work which will be the preparation of a separate ESIA.

- **Step 2: Approval of the Selection and Classification**

The environmental and social screening forms signed by the BESS project PITN2R safeguard specialists will be sent to the national institutions in charge of environmental management. Based on the screening results, the institutions will conduct a comprehensive review of the form and assess the proposed environmental category.

- **Step 3: Determination of Environmental Work**

After analyzing the information contained in the selection results, when an ESIA or ESIN is necessary, the Environmental and Social Safeguard Managers of the BESS project PMUs will perform the following activities:

Preparation of the terms of reference for the ESS to be submitted to the National Environmental Agency for review and approval and to the World Bank for a No-Objection Notice (NON). The TDR model of a typical ESS (ESIN or ESIA) is attached to this ESMF (Annex 7).

- Recruitment of consultants to carry out the required Environmental and Social Study (ESS);
- Preparation of the EIA/ESMP reports by the consultants;
- (Any project investment that leads to involuntary displacement is required to develop a Resettlement Action Plan (RAP) whose level of detail depends on the number of people affected).
- When an environmental and social study is not necessary: the investment/project will be subject to environmental and social prescriptions (ESP), and the Environmental and Social Safeguard Managers of the PMU will consult the ESMF and the mitigation measures checklist to select appropriate mitigation measures.



Cases requiring an ESIA: In some cases, the results of the environmental and social selection will indicate that the planned activities are more complex and therefore require a thorough or simplified ESIA. The ESIA must be carried out by Consultants. In this case, the PMU Safeguard Specialists will proceed with the preparation of the terms of reference for the ESIA to be submitted to the Environmental Agency for approval and to the World Bank for a favorable opinion; recruitment of accredited consultants to conduct the ESIA; conducting public consultations in accordance with the terms of reference; reviews and approval of the ESIA.

- **Step 4: Review, Approval of ESIA Reports, and Obtaining the Environmental Compliance Certificate (ECC)**

The environmental study reports, including Environmental and Social Impact Studies (ESIA), will be submitted for review and approval by the institution in charge of the environment, which will ensure that all environmental and social impacts have been identified and that effective, realistic, and feasible mitigation measures have been proposed as part of the sub-project implementation.

Subsequently, a permit or an environmental compliance certificate must be issued by the minister in charge of the environment.

- **Step 5: Public Consultation and Information Dissemination**

The provisions of national legislation on ESIA stipulate that public information and participation must be ensured during the execution of the environmental impact study, in collaboration with the competent bodies of the concerned administrative and territorial constituency. The execution of Step 5 must comply with NES 1; NES 5, and NES 10 standards of the World Bank's Environmental and Social Standards (ESS). Public information includes one or more project presentation meetings involving local authorities, populations, operators, NGOs, etc. These consultations will identify the main issues and determine the modalities for taking into account the various concerns in the Terms of Reference of the ESIA to be carried out. The results of the consultations will be incorporated into the ESIA report and will be made accessible to the public. To meet the requirements for consultation and dissemination of the World Bank, the BESS Project will produce a dissemination letter in which it will inform the World Bank of the approval of the ESIA, the effective dissemination of all reports produced to all concerned partners, and possibly to the people likely to be affected. It will also grant authorization to the Bank to disseminate these documents on the World Bank's website. It will also grant authorization to the Bank to disseminate





these documents on its website. All these steps leading to the disclosure of safeguard documents must be completed before the project evaluation.

- **Step 6: Integration of Environmental and Social Prescriptions in the Tender Documents and Approval of the ESMP-Site**

For the realization of the ESIA, the project will ensure the integration of recommendations and other environmental and social management measures from these studies in the tender documents and execution of the works by the companies. Binding clauses should be highlighted with sanctions in case of non-implementation of environmental measures. Before the start of the works, the company should submit an Environmental and Social Management Plan for the site (ESMP-Site) to the control office and the PMU for validation. After validation, this ESMP-Site should be implemented in accordance with the environmental prescriptions contained in the Tender Document (DAO).

- **Step 7: Implementation of Environmental and Social Measures**

For each activity or BESS Project, the PMU and private providers are responsible for implementing the environmental and social measures.

- **Step 8: Supervision, Monitoring, and Environmental and Social Monitoring**

Environmental monitoring allows verifying and appreciating the effectiveness, efficiency, and efficacy of the implementation of the BESS Project's environmental measures. This will be done through:

- Supervision at the local or national level will be ensured by the Environmental Safeguard Specialist (SSE) and the Social Development and Gender Specialist (SDSG) of the project and the Designated Specialists of the national services, etc.;
- Proximity monitoring will be done by the Environmental Specialist of the Control Office (SEBC) who will be recruited by the project;
- National external monitoring will be carried out by the national institution in charge of the environment
- Local supervision will be ensured by the communities, Agricultural Development Associations, and NGOs;



- The evaluation will be carried out by environmental Consultants (national and/or international), mid-term and at the end of the project.

### 7.5.2. Process of Environmental Analysis and Validation of BESS Projects Screened

The responsibilities for the environmental management of BESS Projects will be shared among the various stakeholders (UGP Specialists in Environmental and Social Safeguards, and in Local Development, representatives of institutions in charge of the environment, territorial communities, NGOs, and grassroots communities, etc.) through their respective environmental and social management unit, following their specific roles for particular aspects. They will intervene during the different phases of the project's development.

### 7.6. Stakeholder Capacity Building Programme and Training

The effective and efficient implementation of the BESS regulatory framework requires, on the one hand, a collaborative approach between actors where responsibilities are shared among the many stakeholders, to varying degrees, and on the other hand, on the other hand, a strong knowledge of the donor's environmental and social framework. To be certain of this, it is imperative to assess the level of capacity of the actors and, if necessary, to strengthen them in terms of environmental and social safeguarding. This concerns the EEEOA, the PMUs at the national level, the Consultants within the BESS of the General Secretariat of the WAPP which is the key player in the implementation of the CGES.

In this context, the successful implementation of the ESMC, which requires a greater understanding of the responsibilities of the various actors and their individual implications in environmental and social management, will be underpinned by a programme of institutional support and capacity building that focuses on the following points:

Training of PMU members, stakeholders, members of affected communities, consultants on the following topics:

- Environmental and Social Framework (ESF) Requirements Identification and inclusive stakeholder engagement (and monitoring of the PPMP)
- Role and responsibilities in environmental and social monitoring
- Capacity building of stakeholders in the development of safeguarding instruments (SOEP, PGES, PMPP, PGMO, PGD, PGT, PGB, PGPC),
- I&O Documentation & Reports



- Good practices for complaint management and record keeping, including SA&S/HS and PMMs
- Health and safety of the population Management and monitoring of the risks identified in the ESMC
- Work Management Procedures
- Emergency Preparedness and Response

Support to local local communities on the issues, hazards, challenges and responsibilities related to the installed infrastructure. Indeed, the experience gained in the context of energy line projects shows that some inhabitants do not comply with the prohibitions related to the presence of energy infrastructure in their environment and accidents involving communities still occur. Such accidents could be minimized by training tailored to these communities as well as by the distribution of awareness-raising materials. Communities can also play an active role as preferential agents for environmental and social monitoring and monitoring, due to their proximity to the line. Training aimed at communities will therefore both reduce the technological risks associated with the line and maximize their role in surveillance and follow-up, in particular by monitoring bird mortality, nesting monitoring, carcass management, etc.

- The capacity building and training needs of stakeholders will be discussed with regional, national and local administrative stakeholders and analysed in order to validate the content of the training. Questionnaires will also be developed to collect expressions of capacity-building needs.

In addition to the training needs, the human, material and financial resources of the actors were analysed. It is noted that in general, the equipment needed for monitoring and surveillance, as vehicles, measuring equipment and computer equipment are not provided to monitoring teams are scarce. Monitoring and surveillance activities also appear to be underfunded within the public entities interviewed. Human resources are easier to mobilize, although, as mentioned above, a small proportion of staff are adequately trained in environmental and social management



**Table 9 : Training and capacity-building programme.**

Axes	Beneficiaries of the training	Mode of training	Thematic	Animation	Approximate cost
<p>Training on the requirements of the Environmental and Social Framework (ESF) Identification and inclusive engagement of stakeholders (and monitoring of the PPMP)</p> <p>Raise awareness of roles and responsibilities in environmental and social monitoring</p>	Regional, National, Institutions in charge of the environment	3-day training workshop for 20 participants	<p>Review the requirements of the environmental and social framework and overview of environmental aspects of energy projects.</p> <p>Regulations and laws relating to the environment and energy activities.</p> <p>Roles and responsibilities of the various stakeholders in the implementation of the ESMP and the mitigation and enhancement measures and associated management plans</p>	1 expert national (consultant local)	<p>Participant Allowances, Facilitator</p> <p>Room &amp; Health Breaks</p> <p>TOTAL: \$17,000 per country and (\$136,000) the equivalent of 80,000,000 FCFA for the 8 countries concerned</p>
Capacity building of stakeholders in the development of safeguarding instruments (SOEP, PGES,	Regional, National, Institutions in charge of the environment	3-day training workshop  20 participants	<p>Build capacity to undertake the development of specific plans</p> <p>Their importance and usefulness</p>		<p>Participant Allowances, Facilitator</p> <p>Room &amp; Health Breaks</p> <p>TOTAL: \$17,000 per country and</p>



PMPP, PGMO, PGD, PGT, PGB, PGPC),					(\$136,000) the equivalent of 80,000,000 FCFA for the 8 countries concerned
Raise awareness and train the main stakeholders of the project on the implementation of the ESMP, the monitoring of environmental and social performance, as well as the nature of their respective responsibilities	Regional, National, Institutions in charge of the environment	3-day training workshop  20 participants	Overview of the environmental aspects of energy projects.  Regulations and laws relating to the environment and energy activities.  Roles and responsibilities of the various stakeholders in the implementation of the ESMP and the mitigation and enhancement measures as well as associated management plans, both during the construction and operation phases.	1 expert national (consultant local)	Participant Allowances, Facilitator  Room & Health Breaks  Total : 17 700\$  (10 620 000 FCFA)
Good practices for complaint management and record keeping, including SA&S/HS and PMMs	Regional, National, Institutions in charge of the environment	3-day training workshop  20 participants	Emphasize the objectives and main aspects to be developed in a complaints management mechanism, including complaints related to sexual exploitation and abuse and sexual harassment		



<p>Equip national PMUs with the necessary tools, techniques and supports for the effective implementation of the ESMP</p>	<p>Regional, National, Institutions in charge of the environment</p>	<p>2 training workshops of 5 days 20 participants per workshop</p>	<p>Implementation of the ESMP and mitigation and enhancement measures as well as associated management plans during the operational phase.  Environmental Best Practices.  Integration of environmental and social management measures into plans and specifications.  Techniques for managing, negotiating and mediating complaints.  Monitoring of environmental and social performance during the operational phase</p>	<p>1 expert national (consultant)</p>	<p>Participant Allowances International Trainer National Trainer Room and health breaks: Tracking tools: Total :63 pages at 345 \$ (38 007 000 FCFA)</p>
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<p>Support national PMUs on health and safety aspects during site maintenance</p>	<p>Regional, National, Institutions in charge of the environment</p>	<p>1 x 5-day training workshop 20 participants</p>	<p>Health and safety during the maintenance of the right-of-way, including but not limited to the following components:</p> <ul style="list-style-type: none"> <li>Introduction, and use, of toxic or other chemicals harmful to health;</li> <li>Handling of Hazardous Products and Specialized Residual Materials</li> <li>Use of helmets and other safety equipment</li> <li>Treatment of poisonings</li> <li>Chemical and Fire Injuries</li> <li>Security Checks</li> </ul>	<p>1 expert international (consultant)</p>	<p>Participant Allowances International Trainer Health Room &amp; Breaks TOTAL: \$27,550 (16 530 000 FCFA)</p>
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**Table 9 : Training and capacity-building programme**



## 7.7. Complaint Management Mechanisms

A Complaint Management Mechanism (CMM) is an essential tool to enable all stakeholders affected by the Project to express their concerns about the environmental and socio-economic issues affecting them and, if necessary, to take corrective action in a timely manner. These mechanisms are fundamental to ensuring transparency in the ESMP and RAP implementation process. The complaint resolution procedure includes the documentation of complaints (complaint log) to determine the validity of claims.

It is essential that all projects incorporate an accessible, free, easy-to-understand, transparent, responsive and effective complaints management mechanism, which does not limit access to formal remedies (such as courts, including traditional courts), and does not cause any fear of negative consequences for users in the event of an appeal. Affected individuals and households should be informed of the existence of a redress mechanism. General information on the existence of such mechanisms should be made public through community consultations.

Potential complaints and disputes that arise during the preparation of pre-investment studies are often related to the following issues:

- Poor communication about the project;
- Increased marginalization of vulnerable groups in consultations and consultations;
- Dissatisfaction with the economic benefits to local communities during the construction/operation phases;
- Issues related to the influx of labour, including inflation, gender-based violence, sexual abuse and child maltreatment, among others;
- Problems related to the few nuisances caused by construction work such as emissions of dust and other air pollutants, noise emissions, pollution of drinking water, etc.
- The few environmental impacts affecting ecosystem services used by community members (e.g. water pollution or changes in the hydrological regime affecting fisheries resources);
- Issues related to the effects of land-use changes to be set aside for the project;
- Problems related to damage to village or district infrastructure (e.g. roads);
- Disruption of important elements of cultural and archaeological heritage;





### 7.7.1. Objectives of the PMM

The purpose of the complaints mechanism is to provide individuals and communities who feel aggrieved by project activities with accessible, timely, effective and culturally appropriate opportunities to submit their complaints and concerns related to the project.

On the other hand, it aims to identify, propose and implement fair and appropriate solutions in response to the complaints and concerns raised and in particular here that are related to resettlement.

Specifically, the objectives of the complaints mechanism are to:

- Establish a system for receiving, registering and dealing with complaints and concerns in a timely manner, with special attention to vulnerable groups;
- Establish a system for receiving, registering and processing complaints related to gender-based violence (GBV);
- Provide an effective, transparent, timely, fair and non-discriminatory system that would enable aggrieved persons to submit complaints and avoid litigation;
- Promote mediation and amicable settlement of complaints rather than recourse to formal judicial bodies;
- Provide clarification in response to requests for information.
- Any disputes that may arise may be resolved by the PMM described below.



### 7.7.2. Fundamental Principles of the Complaint Management Mechanism

Individuals will only lodge a complaint or express a concern if they are certain that the complaints will be handled promptly, fairly, and without risk or fear of retaliation for themselves or others. To ensure a complaint system is effective, trustworthy, and thus utilized, eight fundamental principles must be adhered to for managing complaints according to best practices:

- **Participation:** Ensure the participation of representatives from all stakeholder groups and fully integrate them into project activities.
- **Contextualization and Relevance:** Adapt to the local context, comply with local governance structures, and fit within the specific framework of the project.
- **Safety:** Carefully assess potential risks to individuals filing a complaint or affected and ensure their protection.
- **Confidentiality:** Guarantee confidential procedures for individuals filing a complaint or affected and limit the number of individuals having access to sensitive information.
- **Respect:** Respect the wishes, choices, rights, and dignity of the individuals filing a complaint, their physical and moral integrity, their privacy, etc., without discrimination.
- **Non-Discrimination:** Avoid marginalization based on ethnic, political, religious, social, economic background, gender, or age, and give equal attention to all complainants.
- **Transparency:** Inform individuals wishing to file a complaint about the procedure by communicating about the purpose and function of the Complaint Management Mechanism (CMM).
- **Accessibility:** Enable access to the CMM for as many people as possible from different stakeholder groups, including the most marginalized or vulnerable and those who are illiterate.

### 7.7.3. Complaints Mechanism

The PMM consists of three main steps: an informal procedure, the complaints committee and the judicial process. At any time or if the stakeholder concerned is dissatisfied with the outcome of the first two steps, he or she may initiate the formal mechanism of justice. Anyone who feels aggrieved at any of the stages of the implementation of the project or RAP will therefore be invited to:

- File, in your locality, a petition with the traditional chiefdom, which will analyze the facts with the national PMU which will rule and propose a solution to the stakeholder concerned.
- If the dispute is not resolved, recourse to the complaints management committee may take place in agreement with the stakeholder concerned. This remedy (prior non-contentious appeal) is to be encouraged and should be strongly supported.



- If the stakeholder concerned is not satisfied, he or she can appeal to the formal legal bodies.

Verbal complaints, like written complaints, will have to be part of the complaint management report. To this end, the PMU will be responsible for organizing the procedure with the leaders of the affected communities: distribution of complaint books, training of those responsible for the consignment, schedule, administrative and financial support, follow-up and preparation of the complaint management report, etc.

The members of the PMU assigned to this task will examine the complaints and propose a solution aimed at an amicable settlement. This procedure will be applied within a maximum period of 10 days after the complaint has been filed by the PAP. If necessary, the chief may call on village elders or people who are respected in the community but also outside the community.

The resolution of the complaint will be duly recorded on the complaint form and countersigned by the PAP in case of agreement. The Complaint Management Report will report on the number of complaints filed, resolved or still in the process of being resolved.

Disputes can result from errors, misunderstanding of project relocation policies, etc., and can often be resolved through audits and/or explanations of clarification to complainants.

#### **7.7.4. Complaint Management Procedure**

To enable communities to make their complaints known, they need to know who to refer to. The issue will be resolved by giving priority to negotiation/conciliation.

The system of reparation may require several steps, namely: an informal procedure, the administrative system and the judicial route. For reasons of efficiency, it is always desirable to resolve a problem locally as well as amicably. Relying on local dispute resolution systems provides sustainable and efficient solutions and avoids adding to conflicts through a structure that requires recourse to the courts.

In this way, the appeal process will be simple and local, as much as possible, so that communities can access it easily. All complaints relating to the non-performance of contracts, the amount of compensation, or extreme cases – such as the seizure of property without compensation – will be addressed to a local local structure. Every effort will be made to resolve complaints amicably.

#### **Level 1: Informal Procedure**



Disputes can result from misunderstandings of the project's relocation policies, and can often be resolved through arbitration using traditional mediation rules. Thus, many disputes can be resolved:

- Through additional explanations (e.g. explaining in detail how the project calculated the complainant's compensation and showing the complainant that the same rules apply to everyone);
- Through arbitration, by calling on elders or people who are respected in the community but also outside it.

As such, traditional chiefs and a member of the national PMU are required to reach informal conciliation. This procedure will be applied within a maximum period of 10 days after the complaint has been filed by the PAP.

## Level 2: The Complaints Committee

A complaints committee is to be set up by the WAPP for this pre-investment phase to deal with complaints about the implementation of the RAP. This committee will be assisted by the WAPP and ECREEE, and its members will include:

- The Coordinator of the National PMU
- The Environmental and Social Specialist of the National PMU
- The environmental and social specialist of the national electricity company
- The administrative authorities (prefectural, municipal) of the region where the project is implemented
- The chief of the village or neighborhood where the complaint was registered.
- A representative of the Committee of Elders and Notables of the Commune;

PAP complaints will initially have to be submitted orally or in writing. These complaints may be submitted to the village chiefs, who will forward them to the Complaints Management Committee. These will be evaluated by the Complaints Management Committee and a proposal for a resolution will be presented to the PAP, if present, or forwarded to the complainant through the PMU. Verbal complaints, like written complaints, will have to be part of the complaint management report. This procedure will be applied within a maximum period of one month after the referral of the complaint by the local chief to the Committee.



### Level 3: Recourse to Courts

If the amicable conciliation procedure fails, recourse will have to be had to the courts.

#### 7.7.5. Different Types of Complaints

All complaints are admissible, and the Conciliation Commission will respond to all appeals. However, complaint management will follow different paths depending on the type of complaint. There are two types of complaints:

Non-sensitive complaints, which can be of two distinct types but all related to activities within the implementation of the environmental and social management plan.

- "PAP" complaints related to compensations, resettlement, livelihood restoration, or the environmental impact of the works, etc.
- "Enterprise" complaints related to work, health, safety, and environment in the workplace.

#### Sensitive complaints

Complaints related to sexual abuse and exploitation, sexual violence, sexual harassment in the workplace, fraud, etc.

Category and Means of Recording Complaints (register: see Annex 1)

Recording the Complaint		Means Used for Submission	
Category	Choice	Channel	Choice
Non-sensitive		Telephone call	
Sensible		SMS	
		Physical submission	
		Mail	
		Email	

#### Non-Sensitive Complaint Management Mechanism (in seven steps):

- 1) Reception, registration & preliminary examination
- 2) Acknowledgment of receipt
- 3) Sorting / filtering & processing procedure



- 4) Verification / investigation & action
- 5) Follow-up evaluation of the recommended mitigation measures
- 6) Feedback to the complainant (and to the general public if applicable)
- 7) Documentation (archiving of indicators)

**Note:** Throughout the 7 steps of the Non-Sensitive Complaint Management Mechanism, monitoring and evaluation data are used to identify issues and improve operational procedures and their performance.

These 7 steps constitute a complete complaint management mechanism involving various actors and responsibilities depending on the nature of the complaint. Each step must be completed within a maximum established processing time.

#### **Responsibilities within this mechanism:**

- Steps 1-2-3 (reception, acknowledgment of receipt & sorting of the complaint) are followed by: the Local Coordination and Monitoring Committee (LCMC) such as LCMC officials and agents, and the Enterprise (social and gender officer).
- Step 4 (first-instance complaint handling) is followed by: LCMC & First Instance Complaint Management Committee (LCMC agents, village chief representing PAP, worker representative, women's organization representative) and enterprise. If no agreement is reached in the first instance, the complaint handling moves to the second instance and this step is followed by LCMC (representatives prefect / sub-prefect municipality / district, UGP environmental and social safeguard expert) & mediation committee and the Enterprise.
- Steps 5-6-7 (follow-up & closure) are followed by: the LCMC



## 8. Conclusion

This harmonized regional environmental framework has been developed in accordance with the legislative and regulatory requirements of ECOWAS member countries, while following regional environmental guidelines and policies for the deployment of BESS in the West African sub-region.

The implementation of the BESS project will generate enormous benefits on the physical environment with the reduction of CO<sub>2</sub> and greenhouse gas (GHG) emissions, energy autonomy and stabilization of the electricity grid; and at the socio-economic level such as youth employment, the development of income-generating activities, the improvement of the environment and the living conditions of the population.

However, potential negative impacts will also result from the implementation of the Project. These include, among others, the deterioration of air quality, noise pollution, the risks of erosion and soil pollution by hydrocarbons and battery electrolytes, the risk of traffic accidents, the risks of occupational accidents, the risks of increased GBV and in particular SEA/HS, the risks of the spread of communicable diseases such as STI/HIV/AIDS and COVID-19, the risks of electrification and electrocution, the risks of fire and explosion, the risk of contracting diseases through exposure to dust and noise, etc.

Indeed, management measures are recommended and should be organized in an Environmental and Social Management Plan (ESMP) to be applied by the institutions of ECOWAS member countries for effective monitoring and evaluation in the implementation of said ESMP. In addition, with very high proportions of wind and solar PV energy expected globally beyond 2030 (for example, 70-80% in some cases), the need for long-term energy storage becomes crucial. This should prompt the initiation of concrete actions and initiatives to facilitate the creation and establishment of regional centers for data collection, management, and treatment of electronic and battery waste at the regional level, in consultation with ECOWAS member countries.

Thus, this regional environmental framework will serve as a guarantor and, consequently, the expected environmental and social impacts and their mitigation measures will ensure that the battery energy storage project complies with legislation, in turn, meets the lessor's safeguard requirements.



## 9. Annex

### 9.1. Annex 1: Complaints Register

BAILLEUR	MAITRE D'OUVRAGE DÉLEGUÉ	MISSION DE CONTRÔLE	ENTREPRISE
Intitulé du projet			
<b>ENREGISTREMENT DES PLAINTES ET TRAITEMENTS</b>			
N°de l'enregistrement:			

<b>1. Localisation de la plainte</b>		
Région :	Département :	Commune :
Tronçon :	Quartier/ Village :	Zone :
<b>2. Informations du plaignant</b>		
Prénom et Nom :		Adresse :





Sexe :	Téléphone :
Adresse :	Age :
CIN :	Fonction :

3. Description de la plainte	
Date :	Heure :
Témoins (prénoms et noms) :	Tél des témoins :
Description	
Attente	Signature du plaignant

4. Traitement de la plainte	
Description de l'action corrective :	
Délais de réalisation :	Date (Plainte traitée) :

5. Visa après traitement		
Plaignant	Vérifié par : Environnementaliste	Approuvé par : Directeur des Travaux
Noms :	Noms :	Noms :



Date :	Date :	Date :
Visa :	Visa :	Visa :



BAILLEUR	MAITRE D'OUVRAGE DÉLÉGUÉ	MISSION DE CONTRÔLE	ENTREPRISE
PROJET ....			
<b>ENREGISTREMENT DES PLAINTES ET TRAITEMENTS DE ...</b>			
N°d'enregistrement:			

<b>1. Localisation de la plainte</b>		
Région:	Département:	Commune:
Tronçon:	Quartier/ Village:	Zone:

<b>2. Informations du plaignant</b>	
Pénom et Nom:	Adresse:
Sexe:	Téléphone:
Adresse:	Age:
CIN:	Fonction:

<b>3. Description de la plainte</b>	
Date:	Heure:
Témoins (prénoms et noms):	Tél des témoins:
Description	
Attente	Signature du plaignant

<b>4. Traitement de la plainte</b>
Description de l'action corrective:



Délais de réalisation:	Date (Plainte traitée):
------------------------	-------------------------

5. Visa après traitement		
Plaignant	Vérifié par: Environnementaliste	Approuvé par: Directeur des Tx
Noms:	Noms:	Noms:
Date:	Date:	Date:
Visa:	Visa:	Visa:



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