Simplified Environmental & Social Impact Assessment – Non-Technical Summary

CABEOLICA EXPANSION PROJECT – Component 4, São Vicente, Cabo Verde

Cabeolica SA

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Acronyms and Abbreviations

Acronym	Definition
AC	Alternating Current
AEB	*Águas e Energía de Boa Vista*
AfdB	African Development Bank
ALARP	As Low As Reasonably Practicable
BAT	Best Available Technology
BESS	Battery Energy Storage System
CESMP	Construction Environmental and Social Management Plan
CM	Camara Municipal
DC	Direct Current
DGASP	*Direção Geral de Agricultura, Silvicultura e Pequária*
DNA	*Direção Nacional do Ambiente*
E&S	Environmental and Social
EIB	European Investment Bank
EPC	Engineering Procurement and Construction
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GRM	Grievance Redress Mechanism
HMA	Hazard Mitigation Analysis
HSE	Health, Safety and Environment
HSP	Health and Safety Plan
IUCN	International Union for Conservation of Nature
KPI	Key Performance Indicator
MESA	Manager of Environmental, Social and Administration
MV	Medium Voltage
NGO	Non-Governmental Organization
OE	Owners Engineer
PCS	Power Conversion System

Acronym	Definition
PPE	Personal Protective Equipment
PM	Particulate Matter
SEP	Stakeholder Engagement Plan
VR	Valued receptors
WMP	Waste Management Plan

1 Introduction

1.1 Project background

Cabeolica, a Private-Public-Partnership between the Government of Cabo Verde, Electra S.A. and Infraco Limited, is a wind energy company in Cabo Verde that owns and operates four (4) independent windfarms, each on one of four islands of the Cabo Verde Archipelago: Sal, São Vicente, Boa Vista, and Santiago. These windfarms began producing energy commercially in May 2012 and have operated continuously; however, they shed considerable levels of produced energy due to insufficient demand loads on the islands.

Cabeolica plans to maximize the delivery of all available energy and reduce the risk of losing potential revenue through the Expansion Project, which comprises the following:

- Component 1: Expansion of the Cabeolica Santiago Wind Farm with three (3) wind turbines with a total net additional power capacity of about 13.5 MW.
- Component 2: Battery Energy Storage System (BESS) of approximately 6 MW / 6 MWh storage capacity for spinning reserve and control, and short-term storage to be installed at the Cabeolica Santiago wind farm.
- Component 3: BESS of approximately 6 MW / 6 MWh storage capacity for grid stability control and short-term storage to be installed at the Cabeolica Sal windfarm.
- Component 4: BESS of approximately 8 MW/8 MWh storage capacity for grid stability control and short-term storage at São Vicente Island, located close to ELECTRA Lazareto Power Station approximately 3.7 km from São Vicente windfarm.
- Component 5: BESS of approximately 6 MW/6 MWh storage capacity for grid stability control and short-term storage at Boa Vista Island, located close to *Águas e Energía de Boa Vista* (AEB) Parcela Power Plant in an industrial area approximately 8.5 km from the Boa Vista windfarm.

The present document is focused on the **Cabeolica Expansion Project to be implemented in São Vicente (Component 4)**.

The National Environmental Impact Assessment Authority (*Direção Nacional do Ambiente*, DNA), confirmed the project categorization[1] according to National Decree-Law No. 27/2020 in June 2023. The project is considered as a "new" activity and are defined as Category B, which require a Simplified Environmental and Social Impact Assessment (ESIA).

1.2 Technical team and elaboration time

This Simplified ESIA was prepared between September 2024 and February 2025 by Advisian in coordination with Environmental Engineer, Pedro Oliveira Ramos, an Environmental Engineer and registered consultant by the DNA. The technical team members are listed in Table 1-1.

[1] Categorizaçao Ambiental BESS – São Vicente, June 2023.

Table 1-1 Identification of the team responsible for the Simplified ESIA

Technician's name	Responsibility	Education	Entity
Pedro Oliveira Ramos	Coordinator of Simplified ESIA	Environmental Engineering	Registered Consultant
Jon Evans	Environmental Assessment Team Lead	Chemistry and Engineering Geology, BSc, MSc	Advisian
Andrea Lázaro	Senior Environmental Consultant	Environmental Sciences, BSc, MSc, PhD	Advisian
Isabel Martínez	Senior Environmental Consultant	Environmental Sciences, BSc, MSc	Advisian
Lina Osorio	Junior Environmental Consultant	Chemical Engineering, BSc, MSc	Advisian

1.3 Purpose and scope of the Simplified ESIA

The scope of the Simplified ESIA is to comply with the Cabo Verde national requirements and to meet European Investment Bank (EIB) and the African Development Bank (AfDB) applicable standards, both by assessing potential impacts of the Project and project-related activities on the biophysical and socio-economic environment, as well as defining the required mitigation measures to avoid or minimise negative impacts and enhance potential benefits. Furthermore, it establishes a systematic approach to stakeholder engagement to ensure that appropriate project information regarding Environmental and Social (E&S) risks and impacts are provided to stakeholders in a manner and format that are timely, understandable, accessible, appropriate and proportionate to the E&S risk categorisation.

This Simplified ESIA was prepared based on desktop information and complemented with information gather in the previous ESIA *Implementation of Battery Energy Storage Systems projects, São Vicente and Boa Vista islands* prepared by the company FUTURE Proman, S.A in 2021 and which included a site visit conducted in August 2021. A further survey for the biological environment was not deemed necessary given the information provided by the 2021 study is recent (within the last 3 years) and valid for the site's location and the limited scale of any potential impacts.

Furthermore, a stakeholder engagement meeting was carried out in São Vicente Island to introduce Cabeolica, the Project, and its components to stakeholders and to provide all available information about the Project with an overview of the E&S impacts and the mitigation measures proposed. The issues raised during the meetings are addressed in the Simplified ESIA (See Section 5). The Stakeholder Engagement Plan prepared for the entire Cabeolica Expansion Project is included as Appendix C of the Simplified ESIA.

2 Overview of the project

2.1 Project location

Component 4 is in the municipality of São Vicente, in the parish of Nossa Senhora da Luz, near the village of Lazareto in the northwest of the island, between Monte Cara and Porto Grande Bay of São Vicente Island in the Cabo Verde Archipelago. The site, owned by Electra, is approximately 200 m from the ELECTRA Lazareto Power Station, as shown in Figure 2-1.

Figure 2-1 Location of Lazareto site.

The nearest inhabited area is Lazareto, which is approximately 300 m from the Lazareto site to the north.

2.2 Project justification

Cabo Verde developed its first Smart Grid Roadmap in 2019 to serve as a guide for future grid modernization investments, leveraging the technological advances and best practices to build an energy infrastructure that supports high levels of intermittent power generation. It is understood that BESS can play a key role in building the required flexibility and resilience into the grid. Furthermore, the Electricity Sector Master Plan (2017-2040) has established ambitious targets for renewable energy penetration of 30% by 2025 and exceed 50% by 2030. 10% of the mentioned targets is expected to be accounted for by Energy Storage, and the BESS to be installed in Sal, Santiago, São Vicente and Boa Vista by Cabeolica are part of this Master Plan.

2.3 Proposed technology and project components

2.3.1 BESS

The Battery Energy Storage System (BESS) is an electrochemical device that provides electrical energy and storage and the discharge capability thanks to the chemical reactions that take place inside the battery cells. It comprises four major components: i) the battery (energy storage unit), ii) the power conversion system / inverter (interface between the Direct Current (DC) battery system and the Alternating Current (AC) power system), iii) the power plant controller (governs, monitors, and executes the intended functions of the energy storage application), and iv) transformers.

Modular BESS are planned, each comprising several battery strings installed in single containers (20'HQ containers) with their respective cooling system. A typical BESS is shown in a modular configuration in Figure 2-2.

Figure 2-2 Typical BESS configuration

The main technical characteristics of the BESS system for São Vicente are listed in Table 2-1. External illustration of the battery container of the BESS is provide in Figure 2-3.

Table 2-1 BESS technical characteristics

BESS Component	Capabilities
No. of installed BESS	1
Power Rating (MW)	8
Energy Capacity Rating (MWh)	8
Rate of discharge requirement	1C
Mode of operation	Spinning Reserve & ancillary services
Connection Voltage (kV)	20
Electrical connection	Underground MV cable of 400 m, connection to the existing Lazareto substation
Battery container	(2x20'HQ) x 3 blocks

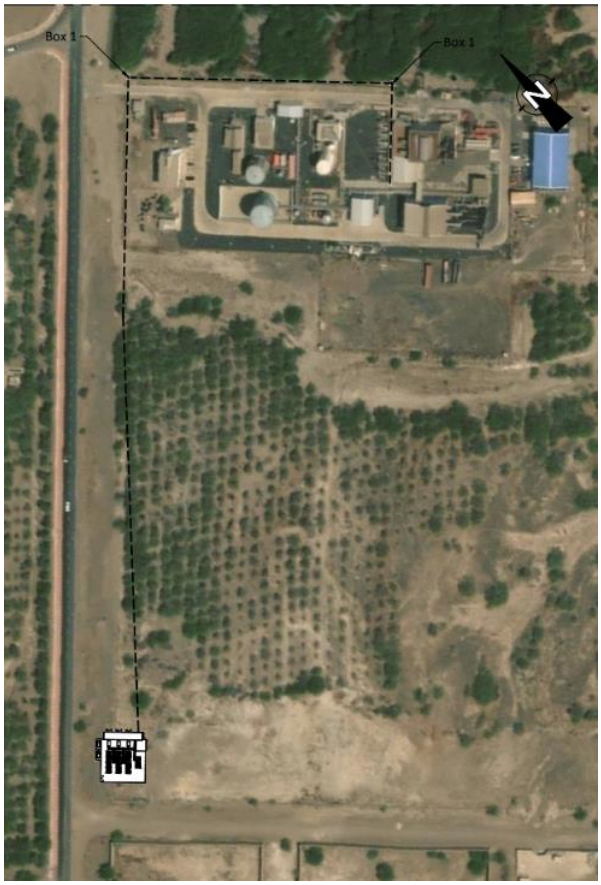
BESS Component	Capabilities
Battery type	Narada Batteries 76.8NESP200 (1C): 3465 kWh installed capacity x 3 blocks = 10395 kWh
Auxiliary system	Direct current distribution panel and alternating current panel, BMS, HVAC, fire system
Power Conversion Systems (PCS	SMA model SCS 3600UP. Rated apparent power (at 25ºC and 1200 V) 3620 kVA. Control system (EMS-PPC) and HMI

Figure 2-3 External view of a battery container of a BESS

2.3.2 Electrical connection

The BESS will require the installation of a single 20kV 3-phase underground circuit to the existing substation (approx. 400 m length in total). The site layout design and presumed layout for the electrical connection is provided in Figure 2-4.

Figure 2-4 São Vicente Site Layout Design and Electrical Connections (black)



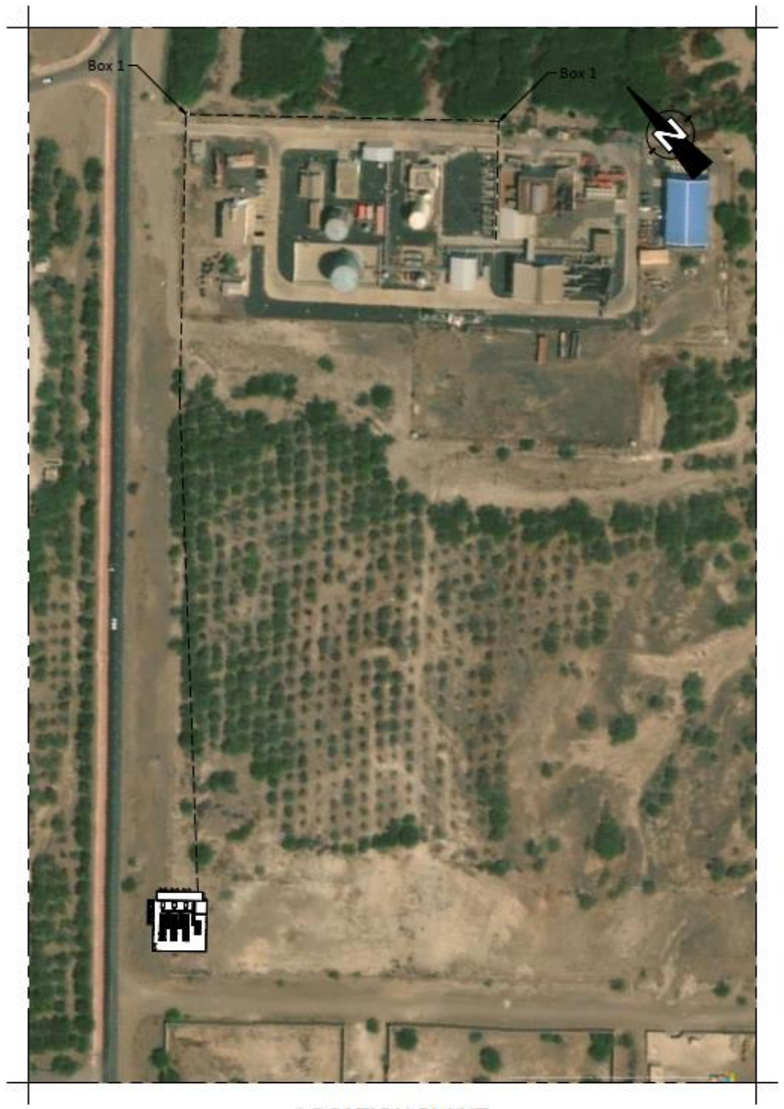
2.3.3 Site layout

The layout for the São Vicente BESS with two sets of containers is shown in Figure 2-5, which includes the following components for the BESS facility:

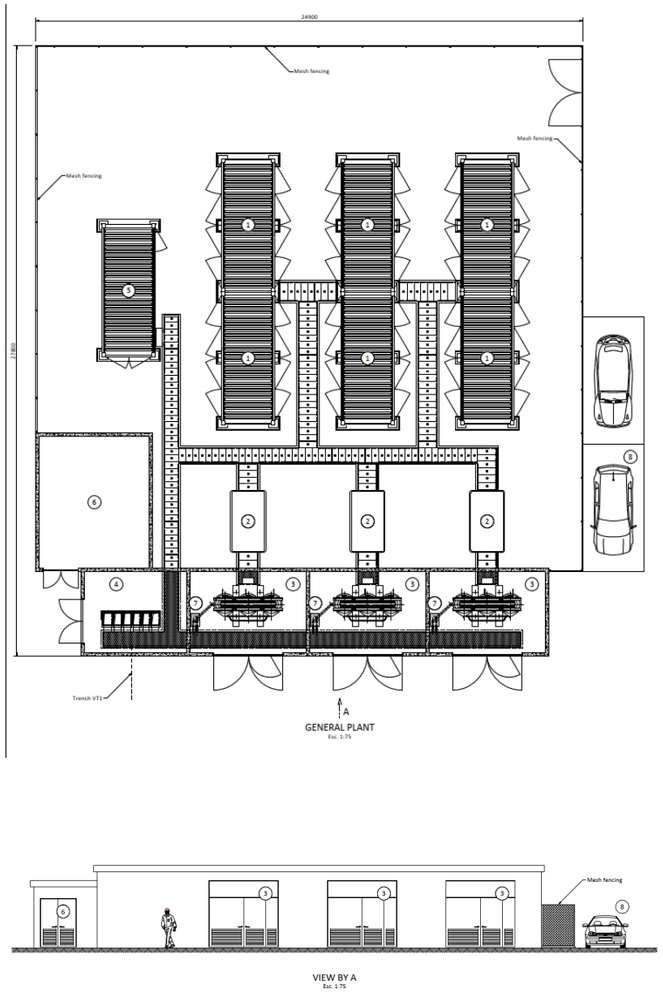
- 6 containerized battery modules
- 3 Inverters (PCS)
- 3 step-up transformers
- 1 MV substation
- 1 LV room and Control house
- 1 warehouse of 30 m^2
- 3 temperature controllers
- 1 parking area with space for two vehicles.

The development of a site layout is an iterative process. As the project progresses to the detailed design stage followed by the construction stage, additional factors may become apparent, such as soil conditions or other constraints on the site.

Figure 2-5 BESS layout on São Vicente Island



LOCATION PLANT
Esc. 1:2000



GENERAL PLANT
Esc. 1:75

VIEW BY A
Esc. 1:75

Part Nr.	Description	Qty.
1	Containerized Battery Module	6
2	Inverter (PCS)	3
3	Step-up Transformer	3
4	Medium Voltage Substation	1
5	Low Voltage Room and Control House	1
6	Warehouse (30m^2)	1
7	Temperature Controller	3
8	Parking	2

2.4 Project phases, key activities, and schedule

Project phases, key activities, and schedule of Cabeolica Expansion Project in São Vicente (Component 4) are summarized in Table 2-2.

Table 2-2 Key project phases and schedule

Project phase	Main activities	Expected schedule
Pre-construction	• Detailed design and BESS layout • Procurement of all necessary equipment and materials for BESS construction • Site mobilization of personnel and equipment • Site preparation and earthwork design • Equipment transportation	≈ 3 months
Construction	• BESS installation - civil works • Electrical and mechanical works • Restoration of temporary work areas	≈ 9 months
Commissioning	• Commissioning tests: electrical tests • Performance tests: site acceptance test for containerized BESS	≈ 1-2 months
Operation and maintenance	• Operation throughout the use of automatic and remote-controlled means. • Periodical monitoring and replacement of individual cells / modules and electrical checks. • Routine maintenance for the main equipment. • Waste management.	20 years
Decommissioning	• Initial assessment and preparation • Disconnection and isolation • Battery removal • Equipment removal • Environmental restoration process	≈ 6 months

2.5 Project footprint

Summaries of the project land use requirements and the project resource requirements and environmental aspects are provided in Table 2-3.

Table 2-3 Project expected land requirements, resources and environmental aspects

PROJECT REQUIREMENTS	PROJECT PHASES	CHARACTERISTICS
LAND REQUIREMENTS	All phases	**Temporary work areas during construction:** 200-300 m^2 **BESS site plot:**. Total area of 735 m^2 to reserve space for potential augmentation. **Underground Cable trench:** 400 m x 1 m ~400 m^2
PROJECT RESOURCES	Pre-construction, construction, and decommissioning	**Water for consumption.** **Water to produce concrete:** supplied using trucks from local suppliers and stored onsite in tanks. **Raw materials:** Cement, concrete and raw materials (e.g., aggregate and fill) will be sourced locally by licensed quarries, generally, and transported to site. **Fuel:** Procured from local suppliers and transported to site. Stored in designated areas with secondary containment. **Power requirements:** onsite diesel generators.

PROJECT REQUIREMENTS	PROJECT PHASES	CHARACTERISTICS
	Operation	**Water, raw materials and power requirements**: Nothing additional to existing operation requirements. **Fuel:** small volumes of oil for maintenance activities, stored in designated areas with secondary containment.
AIR EMISSIONS	Pre-construction, construction, and decommissioning	Dust and particulate matter (PM) Exhaust emissions (SO_2, NO_X, CO_2, and CO)
	Operation	No expected air pollutant emissions.
WASTEWATER AND WATER	Pre-construction, construction, and decommissioning	**Wastewater:** sanitary waste streams from domestic water use and portable toilets. Wastewater collected in dedicated septic tanks. **Solid waste:** construction waste (debris, discarded concrete, empty drums and municipal solid waste (paper, cardboard, plastic and other packages, food waste). **Specific decommissioning waste:** significant quantities of solid waste will be generated during the decommissioning of BESS. Major pieces of equipment may be recyclable or reusable.
	Operation	**Wastewater:** no expected wastewater generation. **Solid waste**: small quantities of waste related to the maintenance of facilities (e.g., packaging waste, used oils).
NOISE	Pre-construction, construction, and decommissioning	Sources of noise equipment and machinery. Sound pressure levels 85-79 dB (A).
	Operation	Sound power levels 60-92.6 dB. Noise sources will be enclosed, so emissions impacts will be reduced to acceptable levels.
WORKFORCE AND ACCOMMODATION	Pre-construction, construction, and decommissioning	10 workers (anticipated) with accommodations in nearby communities.
	Operation	5 indirect workers sourced by BESS provider.

2.6 Project alternatives

The consideration of project alternatives allows for determining whether there are reasonable options to develop the Cabeolica Expansion Project in São Vicente, whilst maintaining an appropriate balance between technical and commercial feasibility and environmental and social mitigation costs.

An overview of the main choices after assessing the alternatives for the BESS Project is provided in Section 4 of the Simplified ESIA and summarized below.

- **Site selection alternatives:** two potential sites that were preliminarily identified were evaluated for São Vicente Expansion Project: Lazareto Power Station and Matiota Substation. After considering that Matiota Substation is within an industrial area in Mindelo with limited space available to install the BESS and that the location at Lazareto will serve as a strategic storage point for several integrated substation and networks, the Lazareto was confirmed as the preferred site.
- **Technology alternatives:** Lithium-ion batteries were selected as the chosen energy storage technology option.
- Finally, the **"no action" alternative**, understood as maintaining the status quo and not embark on the project, was considered.

3 Environmental and social baseline conditions

The geographical boundaries of the area of influence (both direct and indirect) for the BESS São Vicente project are identified in the Simplified ESIA for all environmental and social aspects, of which the environmental baseline conditions are provided in Table 3-1 and the social baseline conditions are provided in Table 3-2.

Table 3-1 Environmental Baseline conditions

Environmental Parameters	Baseline conditions
Climate	The island has a dry tropical climate with trade winds from November to July, and irregular precipitation during the rest of the year. Average annual temperature is approximately 24.8ºC and the average annual precipitation is 189 mm. Dominant winds are from the northeast, reaching average speeds of 20 km/h.
Topography	The project area is a plateau with minor slope (0% to 10%).
Hydrography and groundwater	Evidence of surface water bodies and groundwater abstraction is not encountered at the Lazareto site. This situation was confirmed during fieldwork carried out in August 2021 for the previous ESIA prepared in 2021 by the company FUTURE Proman, S.A.
Geology and soils	The Lazareto site falls within an area of Holocene dune - sand cover. The land is mostly in dune area and marginally in a very arid pasture area. Lithological materials that most directly influence the geology and soils of the site are essentially of eruptive origin.
Air quality	Potential sources of air emissions in the vicinity of the site, within 250 meters of the center point are, the Electra Power Station a civil construction site, a carpentry workshop, a transportation company (Polaris), a detergent production company (Químicas Cintila, Lda), a fish canning and fish feed production factory (large). The paved road connecting the airport with Mindelo is approximately 10 m west of the project area, and an unpaved access road is about 10m south of the area. The former is a source of vehicle emissions and the latter of dust particles from the passage of vehicles.
Noise	The main source of noise is the traffic on the paved road, with low frequency except during periods of entry and exit of the industrial facilities in the area. Sensitive receptors (i.e., residential areas) were not identified within 200 m of the site. The Lazareto village is approximately 300 m from the site to the north.
Protected areas	Designated protected areas are not located within the area of influence of the BESS site. The closest environmental protected area is the Natural Park of Monte Verde, at 8 km east of the Lazareto site (see Figure 2-2).
Flora	Flora in Lazareto site is sparse with some individuals of Acácia americana (*Prosopis juliflora*) (Least Concern as per IUCN) (90% of the vegetation coverage). Invasive species, such as *Nicotiana glauca* (Charuteira) and *Datura stramonium*, are also present.
Fauna	**Avifauna:** Two (2) avifauna species were inventoried in BESS site area: Cabo Verde sparrow (*Passer iagoensis*), which is endemic to Cabo Verde and classified as Least Concern by IUCN, and spectacled warbler (*Curruca conspicillata*), also classified as Least Concern by IUCN but not endemic. However, the Lazareto BESS site does not support or contain habitat conducive to nesting or feeding for these species. **Reptiles and mammals:** The reptile community in São Vicente is represented by two species, both endemic of Cabo Verde: *Chioninia stangeri* and São Vicente wall gecko (*Tarentola substituta*), which is only endemic to São Vicente Island and classified as Least Concern by IUCN. Although the site is included in the geographic range of these species, their presence could not be confirmed during the 2021 visit. Mammals are represented by one rodent species, Mus musculus, and two species of bats, *Pipistrellus kuhlii* and *Pipistrellus hesperidus*, however none were observed during the site visit for the 2021 ESIA.

Figure 3-1 Acácia americana (Prosopis juliflora) species in project area (left) and Invasive species Nicotiana glauca/Datura stramonium (right)

ESIA for the Implementation of BESS projects, São Vicente and Boa Vista islands, Future Proman, 2021

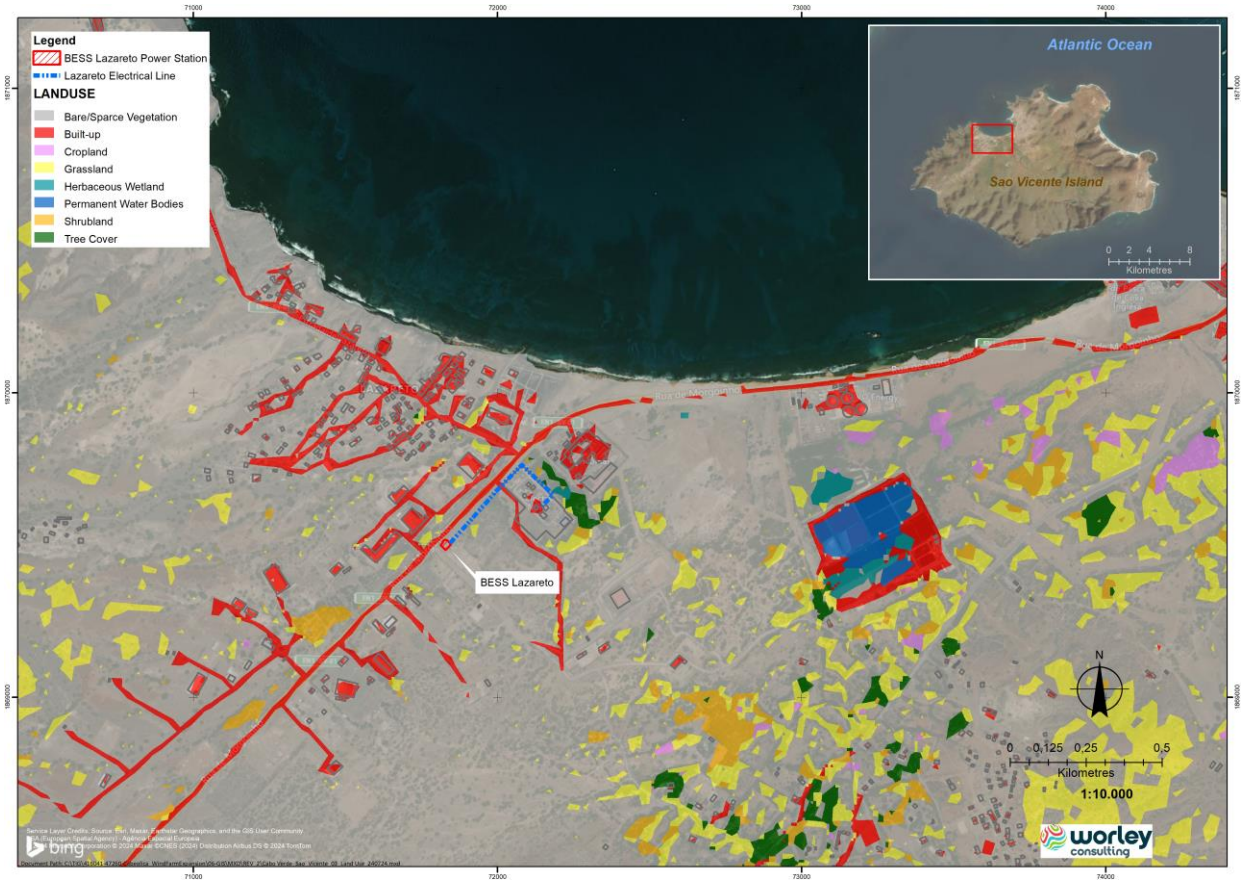
Table 3-2 Social Baseline conditions

Social Parameters	Baseline conditions
Population	São Vicente is the second most populated island in Cabo Verde. The Lazareto site is in the municipality of São Vicente, approximately 300 m from the residential area of Lazareto in the north of the island and has a population of 449 inhabitants.
Health	Health infrastructures in São Vicente consists in one central hospital, 6 health centers, one reproductive health center, three base health units and one health delegation. The central hospital, *Hospital Dr Baptista de Sousa*, is in Mindelo.
Economy	Population in São Vicente Island mainly lives in urban areas (93%) and depend on activities such as the industry, the commerce and the construction. Tourism is an economic activity of growing importance on the island. The island is characterized by an average 10% unemployment rate, which is lower than the total Cabo Verdean average (21%).
Infrastructure	The water for human consumption in São Vicente Island is produced by Electra (public supply network) and supplies to the 70.68% of the population. The rest of the population is supplied by the neighbours, tankers, fountains or wells. On São Vicente, the percentage of the population with a wastewater disposal system was about 85.5%, and more than 98% of the population has a method of disposing solid urban waste. Access to electricity for illumination is 92.27% in the island, and most of the electricity is produced and distributed by Electra. The Lazareto site is in an industrial area, close to the Electra Lazareto Power Station, several industries and shipyards in the surroundings, a paved road west of the study area, and an access road to the south. Roads leading from the delivery Port (a 5-km route, approximately) are tar-sealed and support heavy vehicular traffic. The study area is in service to a road associated with the Mindelo-São Pedro Airport and to an aeronautical route associated with this airport.
Land use	Currently, the Lazareto site has no human use occupation and has a surface cover of light scrub. The BESS site is categorized an a "New Industrial Area" by the EROT-SV Territorial Model Plan for São Vicente Island and as Zone C (areas with urban environment or characterized by large infrastructures and facilities). The EROT-SV identifies the Lazareto site as a flash flood risk zone.
Landscape	The visibility of the site is not impacted by obstacles, and there are no relevant elements of landscape appreciation. The landscape of the site and its immediate surroundings presents low visual quality and poor visual absorption capacity, resulting in a medium visual sensitivity.
Cultural heritage	According to the previous ESIA (2021), the site has no visible cultural heritage with historical or archaeological value. The potential presence of cultural heritage along the electrical connection corridor is currently unknown.

Figure 3-2 Southern boundary of the Lazareto site

ESIA_Implementation of BESS projects, São Vicente and Boa Vista islands, Future Proman, 2021

Figure 3-3 Land Use and Vegetation Cover in and around the BESS Lazareto site



4 Summary of main environmental and social impacts and risks

The Cabeolica Expansion Project in São Vicente will result in environmental and social impacts due to the following, as identified and summarized in the following subsections:

- Normal routine operations
- Non-routine operations (major accidents) and natural disasters (if they were to occur).
- Cumulative effects with other developments present within the area of influence of the Cabeolica Expansion project in São Vicente.

4.1 Environmental and social impacts of routine activities

The significance of routine impacts was evaluated based on the impact magnitude, which are assessed following the method proposed by Conesa (2010) adapted by Advisian, and the importance of Valued Receptors (VR). A detailed description of the impact assessment methodology is included in the Simplified ESIA. Routine impacts were assessed as **COMPATIBLE**, **MODERATE**, **SEVERE**, **CRITICAL** or **POSITIVE**.

Positive impacts

Positive impacts identified per project phase for the Cabeolica Expansion Project in São Vicente are summarized in Table 4-1. The **pre-construction and construction phases** may create potential employment and skills development opportunities for local community members: it is expected a workforce of 10 and where possible it will be sourced locally. Construction-related opportunities are likely to be limited to low skilled jobs and will be temporary in nature. The presence of personnel in the area could increase local demand for goods and some construction materials from local suppliers, which may positively impact local trade.

During **operation**, five indirect jobs will be created. These workers will be sourced by the BESS provider and will be involved in the occasional and planned maintenance activities during a period of 15 years (with the possibility of being extended to 20 years to cover all the battery life period).

Furthermore, the Project will contribute to fuel savings and improved decarbonization factors by installing a spinning reserve operated BESS that will provide sufficient time for additional start-up and grid synchronization instead of relying exclusively on diesel generators. Another benefit is the reduced use of fossil fuels and the subsequently reduced emissions of greenhouse gases.

Table 4-1 Summary of positive impacts of the BESS Project

Project phase	Valued Receptor	Impact	VR Assessment	Impact Significance
Pre-construction and Construction	Local Economy	Creation of employment, skills development, and business opportunities	MEDIUM	POSITIVE
Commissioning, Operation and Maintenance	Global Climate and Air Quality	Reduction in CO_2 emissions due to storage	MEDIUM	POSITIVE

Project phase	Valued Receptor	Impact	VR Assessment	Impact Significance
	Local Economy	Creation of employment, skills development, and business opportunities	MEDIUM	POSITIVE

Negative impacts

Pre-construction and Construction Phases

Main environmental impacts during this phase include the following:

- Decreased air quality and increased noise levels during site construction activities, as well as transport of materials, personnel and equipment.
- Soil loss, compaction, and potential impacts on soil due to inappropriate waste management practices, or vehicle/equipment maintenance.
- Demand of water resources and construction materials
- Direct removal or damage to vegetation within the construction sites.
- Impacts on fauna due to habitat loss (e.g., changing features that shelter fauna and/or directly disturbing nests and burrows)
- Disturbance to fauna, and
- Impact on flora and fauna due to the introduction of invasive alien species.

The installation of the BESS at the São Vicente Lazareto site will be limited to the areas occupied by the temporary work areas (200–300 m^2), the underground cables trench (400 m^2) and the module containers (maximum area of 735 m^2). Equipment and transport requirements for the new BESS at São Vicente, and Boa Vista are not expected to be significant given that pre-construction and construction works will be limited to the transport of the module/s for the BESS, as well as the minimal site grading, foundation, and electrical works required for the chosen BESS location.

Noise emissions during the pre-construction and construction phases of the project are expected to be minimal given that these works will be limited to the transport of the modules for the BESS and limited construction works required for the BESS components.

The direct impact on flora is not expected to be significant because no sensitive habitats have been identified, the site has a modified habitat with low vegetation coverage within a limited site footprint is reduced, and no sensitive species have been identified.

Regarding the impact on fauna due to habitat loss, this impact will also be reduced in extent due to the limited footprint of the project and the overall significance is COMPATIBLE. However, given that the site is included in the geographical range in which *Chioninia stangeri* and São Vicente wall gecko (*Tarentola substituta*) are potentially present - both species endemic to Cabo Verde and the latter only to São Vicente Island- the impact due to habitat loss cannot be excluded. Therefore, as part of the mitigation measures proposed in the ESMP a survey prior to construction activities will be conducted to confirm or exclude the presence of these endemic reptiles species.

The movement of equipment and construction vehicles to site has the potential to introduce invasive alien species to the project site and its adjacent areas from other islands or the continent, and once introduced, invasive species are often very hard to eradicate and will colonise the area permanently. Although the project will involve vehicle movements within the island (from the Port to the project site) and among islands, BESS and other project components will have passed through import checks prior to being cleared for movements to site. The overall significance is COMPATIBLE for both VR.

Finally, water and construction material requirements for the pre-construction and construction phase are consider having a negligible impact on the local and São Vicente Island resources and ecosystem services.

Social impacts and risks anticipated to occur during the construction phase may include:

- Impacts on local communities due to noise and generated dust and air pollution.
- Effects on local infrastructure due to increased traffic and waste generation.
- Change on the visual perception of landscape during construction activities.
- Impacts on local communities due to influx of construction workers and job seekers.
- Damage to cultural heritage resources.

As described above for environmental impacts, equipment and transport requirements for the new BESS at São Vicente are not expected to be significant given that pre-construction and construction works will be limited to the transport of the module/s for the BESS, as well as the minimal site grading, foundation, and electrical works required for the chosen BESS locations. Therefore, impact on local communities due to noise and dust generation, effects on local infrastructure and impacts on landscape are not expected to be significant and the overall significance of these impacts was assessed as COMPATIBLE.

Given the low number of workers and the expected duration of pre-construction and construction activities, social risks related to the influx of workers and job seekers are not expected to be significant and the overall significance of this impacts was assessed as COMPATIBLE.

Commissioning, Operation and Maintenance Phase

The operation of the new components will involve the use of automatic and remote-controlled means, and five indirect jobs will be created. BESS are mostly self-contained systems that rarely involve significant emissions to air, water or soil during normal operating conditions.

The main environmental impact identified during this phase are mainly related to noise or the impact on landscapes of the new BESS.

During operation the BESS is not expected to emit significant noise levels, as their noise emissions are comparable with that of electrical substations. The main sources of noise emissions are the transformers, power conversion systems, and fans and pumps of the heat exchangers and chillers with sound power levels between 60-92 dB. The Noise Calculator -Point Source Model[2] was used during the assessment to anticipate sound pressure level at the nearest sensitive receptor from the BESS site (i.e. 300 m). The combination sources resulted in a total L_{eq} of 40 dB which is below the night noise limit set for sensitive areas 45 dB) in Law 34/VIII/2013. Furthermore, it should be noted that these sources of noise will be enclosed in metal or block buildings / enclosures, so noise emissions impacts will be reduced below the levels estimated and site noise emissions are expected to present negligible additional impact to the existing background noise emissions from the adjacent power station. Thus, the overall significance of this impact was assessed as COMPATIBLE.

Regarding landscape, BESS components will be housed in containers and will permanently occupy a small area in close proximity to the ELECTRA Lazareto Power Station. Therefore, the BESS will resemble the type of buildings in the surroundings and will not have a major intrusive effect on the landscape and the overall significance was assessed as COMPATIBLE.

[2] Noise Tool Calculator: https://noisetools.net/noisecalculator

Impacts during Decommissioning Phase

The potential impacts resulting from this phase are expected to be similar to those predicted for construction (e.g., air and noise), except for impacts associated with SF_6 release (i.e., when electrical equipment is dismantled, the envelope / enclosure containing the SF_6 should be carefully set aside) and waste generation.

The gas SF_6 will be collected and reclaimed at an appropriate facility and reused in new equipment. The importance of this impact is evaluated as low and the overall significance of SF_6 releases was assessed as COMPATIBLE.

Significant quantities of wastes are expected to be generated during the decommissioning phase. The Waste Management Plan (Doc. No. 06106-416041-47260-B-06-0029) shall be updated prior to starting this phase with the identification of available final disposal/recycling facilities. In general, the decommissioning should be accomplished in-line with the applicable regulations at the time of starting these activities. The importance of this impact is evaluated as low, and the overall significance as assessed as COMPATIBLE.

Residual impacts

None of the negative impacts were assessed to be CRITICAL (i.e., above acceptable thresholds that would imply a permanent loss of environmental conditions without recoverability regardless of corrective measures), SEVERE (i.e., requires corrective measures to return to original conditions and recoverability period is medium- or long-term) nor MODERATE (i.e., does not require intensive preventive or corrective measures and the period needed to return to original conditions is not long) prior to the implementation of mitigation measures. All the potential negative impacts have been assessed as COMPATIBLE before the implementation of mitigation measures for routine project activities.

4.2 Anticipated Non-Routine Impacts

Non-routine impacts (major accidents and natural disasters) are unplanned occurrences under abnormal conditions with a probability of occurrence that is not negligible. These were assessed following a risk assessment process focused on accident scenarios with environmental and socioeconomic consequences. Risk severity is assessed as MINOR, MODERATE, HIGH, or URGENT based on the risk level assigned. The risk ratings under each assessed scenario before the implementation of prevention and mitigation measures, based on a combination of their frequency of occurrence and their environmental and social consequences in each case, are as follow:

- Fire and explosion accidents (HIGH Risk).
- Accidents / Collision of vehicles (LOW Risk).
- Leaks and spills of hazardous substances and waste (MODERATE Risk).
- Occurrence of flash floods in São Vicente Island (HIGH Risk).

Assuming the implementation of the mitigation measures described in Section 6.1, all risk scenarios were reduced to MINOR and MODERATE to As Low As Reasonably Practicable (ALARP).

4.3 Cumulative Impacts

Cumulative impacts can result from individually minor but collectively significant activities taking place over a period of time. While each impact may be limited in and of itself, impacts can gradually cause degradation of important resources when taken together and given sufficient time.

The environmental impact assessment for routine and non-routine operations (Sections 4.1 and 4.2, respectively) considered the impacts due to the Cabeolica Expansion Project in São Vicente. Other existing activities in the vicinities of the Lazareto BESS site are summarized in Table 4-2.

Table 4-2 Activities and infrastructures in the vicinity of Lazareto site

Project / Community in the vicinity	Remarks
ELECTRA Lazareto Power Station	Located northeast of BESS site.
Industries and shipyards	Industries and shipyards are located in the surroundings of the study area (within about 250 m), e.g., Polaris, Carpilux Servios de Carpintaria, Químicas Cintila, Tecnicil Indústrial S.V., and Armazem Polaris CIA.
Mindelo-San Pedro Airport Road	The paved road connects São Vicente airport with Mindelo and extends west of the project area.

Figure 4-1 Polaris (transportation company, left) and Cintila (detergent production company, right) in the project surroundings

ESIA for the Implementation of BESS projects, São Vicente and Boa Vista islands, 2021

The results of the assessments of the main cumulative impacts are summarized in Table 4-3. Cumulative impacts of the Project were assessed as COMPATIBLE in all cases.

Table 4-3 Cumulative Impacts for the São Vicente BESS project

VALUED RECEPTORS	CUMULATIVE IMPACTS
AIR QUALITY AND CLIMATE CONDITION	The air quality in the proposed BESS location is affected by the presence of several industries and the circulation of vehicles on the paved road, which connects the San Pedro airport with Mindelo. Among the industries, the Electra Parcela Power Station is the most relevant contributor to the deterioration of local air quality as a stationary source of nitrogen oxides (NO_X) and sulphur dioxide (SO_2) emissions, among others. Other industries and shipyards are in the vicinity of the BESS site, but the nature of their activities would contribute low levels of emissions and do not deteriorate air quality to a significant level. The emissions from circulating vehicles (mainly NOx, CO and CO_2) on the Mindelo-San Pedro Airport Road are not expected to impact significantly on air quality at the Project site, as the volume of traffic is low except during periods of entry and exit from the existing industrial facilities in the area. Considering the above and that the contribution of the project to the increase in air emissions will be limited to construction activities of short duration (9 months), the significance of the cumulative impact on air quality and climate condition is assessed as COMPATIBLE.

VALUED RECEPTORS	CUMULATIVE IMPACTS
ACOUSTIC ENVIRONMENT (NOISE)	The main sources of noise during the BESS construction are expected to be site preparation activities, installation of new components, and increased traffic during the transport of equipment, materials, and personnel from Port locations and accommodations. Cumulative effects during construction activities are not expected to be significant given their short duration (9 months) and the mitigation measures that will be in place to reduce this impact. During operation, the BESS is not anticipated to emit significant noise pressure because all sources of noise will be enclosed in metal or block building / enclosures and is not expected to contribute significantly to existing background levels, which will be dominated by the higher noise levels of the Lazareto Power Station. Given that nearby receptors are industrial activities and that the nearest residential receptors are located at 300-m distance, the significance of the cumulative impact on the acoustic environment is assessed to be COMPATIBLE.
FLORA AND FAUNA	The overall impact on habitat loss and the connectivity of ecosystems by the proposed Cabeolica Expansion Project in São Vicente and other developments in the area is expected to be limited due to the reduce scale of the project at São Vicente nd the industrial nature of the larger area.
LOCAL ECONOMY	The Electricity Sector Master Plan for Cabo Verde (2017-2040) has established ambitious targets for renewable energy penetration of 30% by 2025 and more than 50% by 2030. Energy Storage is expected to meet 10% of the targets, and the BESS to be installed in São Vicente is part of this Master Plan. The Cabeolica Expansion Project will improve the decarbonisation and diversification of the country's energy matrix and will allow for a more stable grid system to reduce the frequency of blackouts in the country.
INFRASTRUCTURES	During pre-construction and construction, the circulation of heavy machinery and vehicles may deteriorate the access roads. In any case, the transport requirements will be reduced and limited to the transport of the modules for the BESS and materials for construction. Given that this activity will be limited to pre-construction and construction and the proposed mitigation measures to be implemented, the significance of the cumulative impact on infrastructure with existing circulation in Mindelo-San Pedro Airport Road is assessed to be COMPATIBLE.
LANDSCAPE	The overall impact on landscape by the Project in São Vicente combined with other developments in the area will be limited given that the BESS will be modular with reduced dimensions in an industrial area. Therefore, the significance of the cumulative visual impact is assessed to be COMPATIBLE.

5 Stakeholder consultations

The consultation process gives stakeholders the opportunity to gain understanding of and comment on the proposed Project and enables the gathering of local information about the project area, the identification of key issues and the consideration of alternative approaches for achieving Project objectives.

During the preparation of the Simplified ESIA, a consultation meeting was carried out at Don Paco Hotel at Mindelo on August 1st, 2024, at 15:30 (local time).

The objectives of the meetings were the following:

- Introduce Cabeolica, the Project and its components to stakeholders and provide all available information about the Project,
- Provide an overview of the environmental and social impacts identified and assessed, and of the mitigation measures proposed to reduce their significance.
- Invite interested parties to participate in the Public Participation process, obtain a broad understanding of the proposed project, raise issues, concerns and to request/ share information regarding the project.

The meeting was attended by different stakeholders, most of whom were represented by companies and local NGOs, as listed in Table 5-1. Names and individuals have not been included in the table due to data protection requirements.

Table 5-1 Attendees to stakeholder engagement meetings

ATTENDEES	
Stakeholder category	**Attendees and organizations represented**
Primary stakeholders - Project affected people / communities	Electra S.A. Electra / EDEC
Secondary stakeholders – NGOs	Biosfera Ass Amigos da Naturaleza
Secondary stakeholders – Other stakeholders	Electric Wind ONSEC S.A. UNSEC S.A.
Internal stakeholders	Cabeolica São Vicente Windfarm - Vestas

In summary, the main discussion topics were related to the expected methodology to be followed to manage waste (batteries and used oils), and other topics related with the fulfilment of applicable legal requirements. NGO representatives asked about confirming the necessity to hire a specialized team for tasks related to the relocation of fauna species during construction activities, and the concerns of an Electra representative were about the economic benefits of the project for the electricity consumer.

Suggestions for improvements to the Project were not made during this engagement.

A summary of issues raised and how they have been addressed is detailed in the Simplified ESIA.

6 Environmental and Social Management Plan

A site-specific Simplified Environmental and Social Management Plan (ESMP) was developed for the Cabeolica Expansion Project in São Vicente with appropriate management measures, including preventive mitigation measures as well as monitoring. This ESMP provides the framework for implementing measures to eliminate, reduce and mitigate negative impacts that have been identified for the Project to acceptable levels and to promote and enhance positive impacts. The main objectives of the ESMP are to provide the following:

- Initial mechanism for ensuring that measures identified to mitigate potentially adverse impacts are implemented.
- Framework for mitigating impacts that may be unforeseen or unidentified until project activities are underway.
- Framework for monitoring programs that will enable Cabeolica to ensure that the company's goals for environmental and social performance are met.

6.1 Mitigation measures

The potential impact on Valued Receptors resulting from the Cabeolica Expansion Project in São Vicente that were evaluated as COMPATIBLE could further lower or eliminate the significance of impacts.

Mitigation measures designed to prevent and minimize impacts from routine operations include, but are not limited to the following:

<u>All Project Phases</u>

- Implement the Cabeolica Expansion Project Stakeholder Engagement Plan included in Appendix C of the ESIA, which includes the identification of stakeholders, the views of stakeholders on the SEP and the timing and methods of engagement with stakeholders throughout the life cycle of the project (MiG 1).
- Implement the Cabeolica Grievance Redress Mechanism (GRM) included in Appendix C of the ESIA to address potential grievances/concerns of interested third parties in a timely manner throughout the Project. All contractors will follow, and integrate proportionally, the Cabeolica GRM procedures, where relevant, into their Project environmental and social management plans and systems as per the SEP (MiG 2)
- Implement the Cabeolica Expansion Project Waste Management Plan (Doc. No. 06106-416041-47260-B-06-0029). Update responsibilities, procedures, and compliance actions as required. (MiG 3).

<u>Pre-construction and construction phases</u>

- Limit construction activities to demarcated areas and follow pre-defined transport routes (MiC 11).
- Maintain the original condition of surface soils and vegetation cover to the extent practical during pre-construction and construction activities. Unnecessary removal of vegetation during construction should be avoided and surrounding vegetation must be protected by employing appropriate fences, covers, etc. If applicable, an authorization for the removal of vegetation will be requested to DGASP (*Direção Geral de Agricultura, Silvicultura e Pequária*) (MiC 16).
- Use existing accesses and transport corridors whenever possible (MiC 17).
- Check the origin of equipment and materials used on site (MiC 18).

- Implement invasive species management procedures, including cleaning of equipment, prior to shipping to site (MiC 19).
- Before initiating construction activities, conduct an initial survey to confirm or exclude the presence of endemic reptiles species. If encountered, ensure that the maximum number of reptiles are removed, and relocated in another area with similar conditions to the original location. Restore habitats for reptiles by adding more refuges, such as piles of large rocks (MiC 21).
- Conduct training and awareness activities for workers involved in the pre-construction and construction works, including environmental topics, general norms for dealing with local population, general rules of hygiene health and safety (HHS) on construction sites, gender-based violence and risks and prevention of sexually transmitted diseases, among others (MiC 28 and MiC 30).
- Promote the use of a local workforce whenever possible and practicable to do so (MiC 29).
- Implement Cabeolica's Labour Codes and Policies which are compliant with national legislation and are considered proportionate for the project: Code of Business Conduct, Ethic & Work Conduct, Anti-bribery and Anti-corruption Policy and Whistleblower Policy (MiC 31).
- Establish a register for interested companies and individuals to assist in the identification of supply and support opportunities during the construction of the BESS components (MiC 34).
- Develop a logistics, traffic, and transportation plan that covers the transportation of heavy components using specialist transportation vehicles (where applicable) (MiC 35).
- Conduct site restoration activities at the end of the construction phase (MiC 38).
- Implement Cabeolica's chance finds procedure (MiC 39).

Commissioning, Operation and Maintenance

- Install best available technology (BAT) compliant with noise emission standards and economically viable for the project (MiO 2).
- Minimize the presence of ancillary structures on the site by minimizing site infrastructure (MiO 7).

Decommissioning Phase

- Recycle SF_6 gas at equipment servicing or disposal at approved facilities (MiD 1).
- Implement leak detection and repair strategies consistent with BAT and economically feasible for the Project (MiD 2).
- Appropriate decommissioning using SF_6 recovery systems. For closed-pressure systems, utilities can purify used SF_6 onsite or off-site or send non-reusable gas for destruction. Evacuate SF_6 from all equipment including hermetically sealed pressure equipment (MiD 3).
- Update the Waste Management Plan (Doc. No. 06106-416041-47260-B-06-0029) prior to starting this phase to guarantee compliance with the applicable regulations at the time of starting these activities and to allow for the identification of available final disposal/recycling facilities (MiD 4).

Mitigation measures designed to prevent and minimize risks from **non-routine events** include, but are not limited to, the following:

- Develop and implement an Emergency Response Plan (ERP) and Health and Safety Plan (HSP) for all facilities (MiN 1).
- Implement the Cabeolica and EPC contractor training programmes as given in the E&S Manual and EPC contract to ensure that personnel onsite respond in a timely manner to accidents, incidents and in the event of an emergency (MiN 7).

- Ensure that appropriate equipped first-aid stations will be easily accessible throughout the site (MiN 9).
- Ensure that regular inspections and maintenance of electrical equipment and fittings are carried out to avoid the risk of fire, as per Cabeolica Health, Safety and Environment (HSE) plan (MiN 10).
- Provide fire and explosion protection, suppression and relief equipment, and suitable personal protective equipment (PPE) (MiN15).
- Implement best practices for mitigating BESS hazards, which may include the following: Hazard Mitigation Analysis (HMA); Smoke and fire detection; Fire control and suppression; Explosion control; Gas detection; Thermal runaway protection; Size and separation requirements; Water supply; Explosion prevention systems; and Deflagration venting (MiN 16).
- Ensure driver safety training are provided and verify driver qualifications (MiN 17).
- Vehicles and other equipment shall be subjected to regular maintenance and inspections to avoid spills and leakage of fuels and lubricants (MiN20).
- Implementation of Cabeolica Expansion Project Waste Management Plan (WMP) (Doc. No. 06106-416041-47260-B-06-0029) (MiN 27).

6.2 Monitoring Plan

The Monitoring Plan defines the actions to be carried out prior to and/or during project activities to verify the effective implementation of mitigation measures and the compliance of impacts from activities within acceptable limits. Details of the valued receptors subject to monitoring, the proposed measure, the monitoring frequency, and those responsible are listed in Table 6-1 to Table 6-5.

Table 6-1 Monitoring activities for Cross-cutting mitigation measures applicable to all phases.

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility
All	All impacts	MiG 1	MoG 1 Verification of Cabeolica Expansion Project SEP implementation during subsequent phases.	-	**Meetings:** No. of meetings held. **Communication materials:** No. of communication materials produced and disseminated. **Use of social media platforms:** No. of social media messages published/No. of reactions to messages in social media. **Training of internal stakeholders on SEP**: No. of training sessions and hours of training.	List of participants in each meeting. Pictures of the event. Attendance register. List of comments raised during the meeting. Communication material. Evidence of publication in social media platforms. List of participants in each training session.	Continuous through construction activities and regular follow up during remaining phases	Cabeolica (MESA) EPC Contractor (HSE Manager)
	All impacts	MiG 2 MiN 3 MiN 4	MoG 2 Verification of Cabeolica GRM implementation. Register and address, in a timely manner, the complaints received from local community and onsite workers	-	No. of close-out complaints are equal to No. of complaints received.	Grievance forms. Grievance register.	Continuous through construction activities and regular follow up during remaining phases	EPC Contractor (HSE Manager) Cabeolica (MESA)
	All impacts	MiG 3 MiN 27 MiN 28	MoG 3 Verification of Cabeolica Expansion Project WMP implementation	-	Quantities of waste (hazardous and non-hazardous) stored per month. Quantities of waste (hazardous and non-hazardous) delivered per month (if any) and management operation to which they were subjected.	Waste data tracking. HSE inspections records.	Continuous through construction activities and regular follow up during remaining phases	EPC Contractor (HSE Manager) Cabeolica (MESA)

Table 6-2 Monitoring activities during Pre-construction and Construction.

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility
Air Quality	Decreased air quality and impact on climate change	MiC 1	MoC 1 Verify that low-sulphur diesel (<1.5%) is used to reduce emissions	-	Fuel consumption (m^3) and type of fuel	Fuel specification. Fuel consumption register.	Monthly during construction	EPC Contractor (HSE Manager)
		MiC 2	MoC 2 Verify appropriate equipment and vehicles operation and maintenance	-	Percentage (%) of vehicles/machinery serviced as per maintenance procedures	Equipment and vehicles maintenance/inspection records	Monthly during construction	EPC Contractor (HSE Manager)
		MiC 4	MoC 3 Verify that Logistic, Traffic and Transportation Plan to limit transport to essential travel is in place and is followed	-	Daily number of transportation trucks moving in and out of the site not exceeding estimates included under the plan. Routes followed vs planned.	Register of signing in and out of trucks at security gate.	Monthly during construction	EPC Contractor (HSE Manager)
		MiC 3 MiC 5 MiC 6	MoC 4 Verify dust / combustion pollutants reduction strategies	Site construction areas and access roads	Volume of water used for irrigation (m^3). Percentage (%) of vehicles/machinery serviced as per maintenance procedures.	Irrigation records. Equipment and vehicles maintenance/inspection records.	Daily during construction	EPC Contractor (HSE Manager)

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility
Acoustic Environment	Increased ambient noise levels	MiC 7 MiC 9	MoC 5 Verify that all site equipment is within acceptable noise standards	-	Percentage (%) of vehicles/machinery serviced as per maintenance procedures.	Equipment and vehicles maintenance/inspection records.	Monthly during construction	EPC Contractor (HSE Manager)
		MiO2	MoC 6 Verify that BAT compliant with noise emissions standards and economically viable for the project is adopted in final BESS design	-	Number and type of BAT adopted in final BESS design compliant with noise emissions standards.	Final design.	Once during pre-construction, with final design	Cabeolica, and BESS Provider
Soil, Flora and Fauna	Soil loss, compaction and impacts on soil quality Direct removal or damage to vegetation	MiC 10 MiC 11 MiC 15 MiC 17	MoC 7 Periodic verification that areas used for construction activities are restricted to the areas delimited for this purpose	Site construction areas and access roads	Surface of areas occupied during construction vs planned	HSE inspection records Photographic records	Weekly during construction	EPC Contractor (HSE Manager)
		MiC 12 MiC 16	MoC 8 Verify that excavated soil is preserved for reuse during restoration activities, when possible	Site construction areas and access roads	Volume of soil excavated vs volume of soil used for restoration activities.	HSE inspection records. Photographic records.	Daily during site preparation activities and once after restoration activities	EPC Contractor (HSE Manager)
		MiC 16	MoC 9 Verify that, when applicable, authorization for the removal of vegetation is requested to *Direção Geral de Agricultura, Silvicultura e Pequária* (DGASP).	Site construction areas and access roads	Number of permits obtained in accordance with legal requirements	Permits obtained (when applicable)	Once, before construction activities	EPC Contractor (HSE Manager)
	Impact on fauna due to habitat loss	MiC 21	MoC 10 Verify that an initial site survey to identify areas of high concentration of fauna individuals (including photographic survey of sites where components will be installed) is conducted before initiating construction activities	Site construction areas and access roads	Number and type of sensitive species affected. Number of permits obtained in accordance with legal requirements.	GPS location and photographic records of areas where final components will be located. GPS location of species to be removed. Permits obtained (where applicable).	Once, before construction activities	Cabeolica (MESA)
		MiC 21	MoC 11 Verification of removal of species categorized as Endangered or Critically Endangered Species by the IUCN Red List and endemic species (where applicable)	Site construction areas and access roads				Cabeolica (MESA) EPC Contractor (HSE Manager)
		MiC 21	MoC 12 Verification of relocation of fauna species where important concentrations have been observed (where applicable), and sensitive species are affected.	Site construction areas and access roads	Number of sensitive species relocated and destination (where applicable) (per specie)	HSE inspections records Photographic records	Once before construction	Cabeolica (MESA) EPC Contractor (HSE Manager)
		MiC 21	MoC 13 Verification of site restoration measures of areas affected by construction activities	Site construction areas and access roads	Surface of areas restored vs planned.	HSE inspection records. Photographic records.	Once, at the end of construction	Cabeolica (MESA) EPC Contractor (HSE Manager)
	Disturbance to fauna	MiC 24	MoC 14 Verify that all waste on site will be correctly stored and disposed off-site and that no edible waste (e.g. remains of animal carcasses, bones etc.) will be left on site during construction.	Site construction areas and access roads	Number of complaints or warning notices issues by HSE Manager	Warning notices issued	Daily during construction activities	EPC Contractor (HSE Manager)
		MiC 25	MoC 15 Verify that light during nighttime is minimized to avoid fauna attraction	Site construction areas	Lux levels used during night in compliance with final design and legislation	HSE inspections records	Once, before the start of construction	EPC Contractor (HSE Manager)
		MiC 26	MoC 16 Verify implementation of safe speed limits and driving through pre-defined routs	Site construction areas and access roads	Number of wildlife collisions	HSE inspection records	Daily during construction activities	EPC Contractor (HSE Manager)

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility
	Impact on flora and fauna due to the introduction of invasive flora and fauna alien species	MiC 18 MiC 19 MiC 22	MoC 17 Check origin of equipment and very cleaning of materials used on site to prevent the introduction of alien species	-	Percentage (%) of vehicles/machinery cleaned as per invasive flora and fauna prevention procedures.	HSE inspections records	Every time new equipment or machinery is brought to site	EPC Contractor (HSE Manager)
Demand of project resources	Demand of natural resources for construction materials	MiC 13 MiC 14	MoC 18 Register sources and quantities of water, raw materials and power requirements	-	Quantities and sources of origin of natural resources used during construction	Record of natural resources consumption Record of construction material	Monthly	EPC Contractor (HSE Manager)
Population/ Local Economy	Impact on local communities due to: - noise, dust, and air pollution - influx of construction workers and job seekers	MiC 28 MiC 30	MoC 19 Register training and awareness activities for workers	-	Number of workers participating in minimum one training and awareness session Training hours recorded.	Training matrix Training schedule Lists of participants	Once before construction and every time new workers are admitted	Cabeolica (MESA) EPC Contractor (HSE Manager)
		MiC 31 MiC 32	MoC 20 Verify implementation of Cabeolica's Labour Codes and Policies and that mechanisms to penalize situations related to gender-based discrimination, harassment, violence, sexual exploitation, and abuse of minors and other vulnerable communities are in place	-	No. of close-out complaints related to non-compliance with Labour Codes and Policies are equal to No. of complaints received.	EPC contract, policies and CCESMP. Cabeolica Labour Codes and Policies. Grievance register.	Once before pre-construction	Cabeolica (MESA) EPC Contractor (HSE Manager)
	Creation of employment, skills development, and business opportunities	MiC 29 MiC 33	MoC 21 Register employment created by the Company (direct and indirect) and verify that the use of local workforce is promoted when practicable to do so	-	Number of jobs created, gender ratio, and local employee ratio.	Employment records.	Monthly	Cabeolica (MESA) EPC Contractor (HSE Manager)
		MiC 34	MoC 22 Verify that a register of interested companies and individuals is created to supply and support opportunities during construction	-	Number of companies and individuals identified, gender ratio and local employee ratio	Company Register.	Once, before construction	Cabeolica (MESA)
Infrastructure	Effects on local infrastructure due to increased traffic	MiC 35	MoC 23 Verify that a logistics, traffic and transportation plan is developed (where applicable)	-	Daily number of transportation trucks moving in and out of the site not exceeding estimates included under the plan. Routes followed vs planned.	Register of signing in and out of trucks at security gate	Once, before construction	Cabeolica (MESA) EPC Contractor (HSE Manager)
		MiC 36	MoC 24 Verification that roads and accesses in the vicinity of project areas are not obstructed or are in poor conditions	Access roads	Number of incidents or close-out complaints received related to road and access conditions are equal to No. of complaints received	HSE inspections records Photographic record.	Weekly	EPC Contractor (HSE Manager)
Landscape	Change on the visual perception of landscape	MiC 38 MiO 7	MoC 25 Verification of site restoration measures and landscape integration work	Site construction areas and access roads	Surface of areas restored vs planned.	Final design Photographic record	Once during pre-construction, with final design Once, at the end of construction	EPC Contractor (HSE Manager)
Cultural Heritage	Damage to cultural heritage resources	MiC 39	MoC 26 Verify implementation of Cabeolica's chance finds procedure	Site construction areas and access roads	Number of chance finds identified and actions taken (where applicable)	Report of findings and actions taken (where applicable)	Daily during earthworks works	Cabeolica (MESA) EPC Contractor (HSE Manager)

Table 6-3 Monitoring activities during Operation

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
Air Quality	Decreased air quality and impact on climate change	MiO 1	MoO 1 Verify that low-sulphur diesel (<1.5%) is used to reduce emissions.	BESS site area	Fuel consumption (m^3) and type	Fuel specification. Fuel consumption register	During maintenance operations	Cabeolica (MESA), Vestas and BESS provider
			MoO 2 Verify appropriate equipment and vehicles operation and maintenance	BESS site area	Percentage (%) of vehicles/machinery serviced as per maintenance procedures	Equipment and vehicles maintenance/inspections records	During maintenance operations	Cabeolica (MESA), Vestas and BESS provider
			MoO 3 Verify that machinery and equipment is switched-of when not in use.	BESS site area	Number of complaints or warning notices issues by HSE Manager	Warning notices issued	During maintenance operations	Cabeolica (MESA), Vestas and BESS provider
		MiD 1 MiD 2	MoO 4 Verify that SF_6 gas leak detection and repair strategies are implemented and that gas is recycled or disposed at approved facilities.	-	Percentage (%) of equipment serviced as per maintenance procedures. Quantities and type of gas recovered during the operation phase.	Records including information on: i) Quantity and type of gas in equipment when installed. ii) Quantity and type of gas added during maintenance. iii) Dates and results of mandatory leak checks. iv) Registered waste carrier used to dispose gas.	During maintenance operations	Cabeolica (MESA), Vestas and BESS provider
Acoustic Environment	Increased ambient noise levels (BESS and general O&M activities)	MiO 3	MoO 5 Verify appropriate equipment and vehicles operation and maintenance	BESS site area	Percentage (%) of equipment and vehicles serviced as per maintenance procedures	Equipment and vehicles maintenance/inspection records	During maintenance operations	Cabeolica (MESA), Vestas and BESS provider
Fauna	Disturbance to fauna	MiO 4	MoO 6 Verify that light during nighttime is minimized to avoid fauna attraction	BESS site area	Lux levels used during night in compliance with final design and legislation	HSE inspections records	Regular follow-up during this phase	Cabeolica (MESA)
			MoO 7 Verify that all waste on site is correctly stored and disposed off-site and that no edible waste (e.g. remains of animal carcasses, bones etc.) will be left on site during construction.	BESS site area	Number of complaints or warning notices issues by HSE Manager	Warning notices issued	Regular follow-up during this phase	Cabeolica (MESA)
Population and Local Economy	Creation of employment, skills development, and business opportunities	MiO 6	MoO 8 Register employment created by the Company (direct and indirect) and verify that the use of local workforce is promoted when practicable to do so	-	Number of jobs created, gender ratio, and local employee ratio.	Employment records Annual Monitoring report	As part of Annual Windfarm monitoring	Cabeolica (MESA)

Table 6-4 Monitoring activities during Decomissioning

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
Air Quality	Impact on global climate due to SF_6 release	MiD 3	MoD 1 Verify that appropriate SF6 gas recovering systems are used during this phase	-	Quantities and type of gas recovered during this phase.	Records of waste carrier used to dispose the gas.	Once during decommissioning	Cabeolica (MESA), Vestas and BESS provider
Infrastructure	Impact on waste management infrastructure due to waste generation	MiD 4	MoO 4 Verify that the Cabeolica Expansion Project Waste Management Plan is updated.	-	Quantities of waste (hazardous and non-hazardous) stored per month.	Production of updated plan.	Once, before the start of the decommissioning phase.	Cabeolica (MESA), Vestas and BESS provider

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
					Quantities of waste (hazardous and non-hazardous) delivered per month (if any) and management operation to which they were subjected.			

Table 6-5 Monitoring activities for non-routine events

Non-routine event	Mitigation measure	Monitoring Measure	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
All non-routine events	MiN 1	MoN 1 Verification of ERP and HSE plans preparation and implementation	-	ERP and HSE Plans in place and adhered to.	Once before each phase and regular follow-up during all phases	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 2	MoN 2 Verification of record of incidents	Number and types of emergency and non-routine situations.	Report of incidents and actions taken (where applicable)	Continuous during all phases	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 5	MoN 3 Verify that good housekeeping is kept at all times	Number of observations and non-conformances identified	HSE inspection records Photographic records	Continuous during all phases	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 6	MoN 4 Verify that MSDS and safety instructions are clearly displayed in the storage areas	Number and type of MSDS displayed are equal to number and type of hazardous materials stored	HSE inspection records Photographic records	Once before each phase and regular follow-up during all phases	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 7 MiN 14 MiN 17	MoN 5 Verify that Cabeolica and EPC contractor training systems are implemented to ensure that onsite personnel are familiarized with safety requirements related to their respective job assignments and respond in a timely manner to accidents, incidents and in case of emergency.	Number of workers participating in training and awareness sessions and training hours dedicated.	Training matrix Training schedule List of trainees	Once before each phase and every time new workers are admitted	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 8 MiN 9	MoN 6 Verify that emergency alarm systems, where applicable, are both audible and visible and that appropriately equipped first aid stations are accessible through the site.	Percentage (%) of emergency alarm systems displayed and serviced as per maintenance procedures. No. of drills.	HSE inspection records Photographic records Maintenance records	Once before each phase and regular follow-up during all phases	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 11 MiN 21	MoN 7 Verify that fire response and spill response equipment are routinely inspected, maintained, and operationally exercised and tested, and is available as necessary for response.	Percentage (%) of fire response and spill response equipment serviced and inspected as per maintenance procedures. No of drills.	HSE inspection records Photographic records Maintenance records	Once before each phase and regular follow-up during all phases	EPC Contractor (HSE Manager) Cabeolica (MESA)
Fire and explosion accidents	MiN 10 MiN 13	MoN 8 Verify regular inspection and maintenance of electrical equipment and installation of circuit breakers in the power supply to avoid risk of fire.	Percentage (%) of circuit breakers installed and serviced as per maintenance procedures	HSE inspection records Photographic records Maintenance records	Once before each phase and regular follow-up during all phases	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 12	MoN 9 Check that specific information about the facility is provided to local fire services to coordinate the rapid response	Number of communications / meetings held with local fire services	Evidence of communication	Once before operation	Cabeolica (MESA)
	MiN 15	MoN 10 Verify that fire and explosion protection, suppression and relief equipment, and PPE required per the job titles are provided and regularly inspected	Percentage (%) of PEE procured and being used by workers.	PPE register Maintenance records Inspections records	Once before each phase and regular follow-up during all phases	EPC Contractor (HSE Manager)

Non-routine event	Mitigation measure	Monitoring Measure	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
	MiN 16	MoN 11 Verify that best practices for mitigating BESS hazards are adopted in the final design	Number and type of BAT adopted for mitigation BESS hazards	Final design	Once during pre-construction, with final design	BESS provider
Accidents / Collision of vehicles	MiN 17	MoN 12 Verify drivers qualifications	Number of drivers and qualifications No drivers attending driver safety training	Drivers' license Training records	Once before construction and every time new drivers are admitted	EPC Contractor (HSE Manager)
	MiN 18 MiN 19	MoN 13 Verify that Logistic, Traffic and Transportation Plan is followed	Number of accidents or collisions Routes followed vs planned	Register of signing in and out of trucks at security gate. Incident reports.	Once before construction phase and monthly follow-up during this phase	EPC Contractor (HSE Manager)
Leaks and spills of hazardous substances and wastes	MiN 20	MoN 14 Verify regular maintenance and inspections to vehicles and other equipment to prevent fuel and lubricant spills and leaks	Percentage (%) of vehicles/machinery serviced and inspected as per maintenance procedures	Equipment and vehicles maintenance/inspection records	Once before each phase and regular follow-up during this phase	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 22	MoN 15 Verify that storage areas and containers are properly equipped with paved areas, secondary containment and a spill kit	Number of observations and non-conformances identified	HSE inspection records Photographic records	Once before each phase and regular follow-up during this phase	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 23 MiN 24	MoN 16 Verify that appropriate containers and receipts are used according to the type of hazardous substance or waste and that these are stored in a defined space only accessible to authorized personnel	Number of observations and non-conformances identified	HSE inspection records Photographic records	Once before each phase and regular follow-up during this phase	EPC Contractor (HSE Manager) Cabeolica (MESA)
	MiN 25 MiN 26	MoN 17 In case of a leak or spill, verify that the incident is documented and that appropriate clean-up measures were adopted	Number and types of emergency and non-routine situations.	Report of incidents and actions taken (where applicable)	In case of leak or spill event	EPC Contractor (HSE Manager) Cabeolica (MESA)
Occurrence of flash floods	MiN 29	MoN 19 Verify that the Storm Event Intensity for the area has been considered in the design of site drainage	Parameters used in the design of site drainage	Final design	Once during pre-construction, with final design	EPC Contractor (HSE Manager)
	MiN 30	MoN 20 Verify that ERP is aligned with Cabo Verde Emergency Preparedness and Response Plans	Inclusion of measures to prevent the consequences of flash floods	ERP plan	Once before construction	Cabeolica (MESA) EPC Contractor (HSE Manager)

During the operation phase, monitoring activities of new components will be integrated into the current monitoring activities conducted by Cabeolica. The current scope includes an **annual environmental and social monitoring report** to be submitted to *Direção Nacional do Ambiente* with a compiled summary of the environmental and social activities executed throughout the year at the four windfarms.

Monitoring activities during the decommissioning phase will be similar to those proposed for pre-construction and construction and will be incorporated into the Decommissioning Plan for the Project.

6.3 Roles and responsibilities

The successful implementation of an Environmental and Social Management Plan (ESMP) is often determined by the clarity of the roles and responsibilities given to employees and EPC Contractors to undertake the necessary actions. This requires recognition by top management of the resources required to implement and control the ESMP for the project.

The following distribution of direct responsibilities in the environmental and social management for the project is proposed:

- Cabeolica: The Environmental, Social and Administration Manager (MESA) will establish the terms of reference to be observed for the environmental and social management of the Project, based on the applicable legal requirements, the ESMP, and the requirements of the Project's financing entities, and will ensure that these terms of reference are complied with.

  Cabeolica will be in charge of obtaining licenses and authorizations for carrying out the Project before construction, engaging in formal articulation with the various official entities involved in the process, and implementing the Grievance Redress Management (GRM) mechanism to receive and process complaints related to the Project.
- EPC Contractor: The EPC Contractor awarded the contract to design, deliver, and install the BESS Project will be responsible for the physical execution of the works under the supervision of the Owners' Engineer. As such, the EPC Contractor will be responsible for the completion and detailing and adequate implementation of the ESMP including the Contractors Construction Environmental and Social Management Plan (CCESMP).

  As part of the preparatory work, the EPC Contractor will complete and detail the general requirements established in this ESMP, depending on the specificities of its organization and the human and material resources that will be assigned to the work. The revised ESMP will be submitted for approval by Cabeolica (assisted by the OE) before the start of work. Once approved, the revised document will become the EPC Contractor's ESMP (CESMP).

  All contractors will follow, and integrate proportionally, the Cabeolica GRM procedures, where relevant, into their Project environmental and social management plans and systems as per the Cabeolica's Expansion Project Stakeholder Engagement Plan.
- Owner's Engineer (OE): The activities that the OE will oversee will include, among others, assisting Cabeolica in the procurement of goods and services related to the BESS Project, controlling and supervising the construction works, supporting the implementation of the training program, and supporting and monitoring the implementation of environmental and social safeguard measures.

6.4 Grievance Redress Mechanism

A Grievance Redress Mechanism has been implemented by Cabeolica as part of the Cabeolica ESMS to receive, assess and settle grievances of Cabeolica employees and external stakeholders in the shortest time possible, at the lowest possible level of authority, and to assess and provide resolutions of complaints and then monitor the close-out of those grievances.

The grievance mechanism enables external and internal stakeholders (including project and Cabeolica workers, whether direct or indirect) to submit comments, concerns, questions, grievances, and feedback about Cabeolica and its work. Objectives of the mechanism are to:

- Provide a predictable, transparent, and credible process for resolving grievances,
- Build confidence as an integral component of Cabeolica relationships with employees, local communities, authorities, and other stakeholders, and
- Enable rapid identification of the emerging issues and trends, and thereby facilitate corrective actions and follow-up.

Anyone who identifies an irregularity, has a concern, or wants to submit a suggestion can use the grievance mechanism to report and facilitate its identification and correction, if necessary.

Adequate public communication channels have been put in place during the Design Phase, so that grievances can be submitted via the following channels:

- Telephone: +238 260 22 60
- Mail: cabeolica@cabeolica.com
- Website: www.cabeolica.com
- Registries available in each corresponding municipality (*Camara Municipal da Praia* (CMP), *Camara Municipal de Sal* (CMS), *Camara Municipal da São Vicente and Camara Municipal da Boa Vista).*

Grievances are recorded in the Grievance Log and recorded annually in the Annual Monitoring Report.

6.5 Reporting requirements and indicators

The following reporting requirements shall be applicable:

- Weekly: The EPC Contractor will provide a summary of progress in implementing the ESMP and CCESMP for environmental and social aspects under their control and responsibility.
- Monthly: The EPC Contractor will present a detailed report containing all records produced and an assessment of incidents during the previous month. The monthly report will be produced with the structure defined in the revised ESAP and will be delivered to the OE.
- The OE will keep Cabeolica informed about the progress of the work, submitting a monthly status report that covers the most relevant environmental and social matters, without prejudice, and will participate in ad hoc communications in the event of urgent or emergency situations when requested by Cabeolica`s MESA.

The monthly reports prepared by the EPC Contractor will include the KPIs (Key Performance Indicators) included in Section 6.2. These indicators will be considered by the OE in the preparation of its monthly report to Cabeolica, which will also contain the following indicators:

- Non-conformities: Number of non-conformities (non-compliances with environmental and social management measures) identified by the OE. Average time to resolve identified non-conformities.
- Grievance: Number of complaints received through the GRM. Average response time to complaints received and average time taken to resolve the issues in question.

Cabeolica will also comply with the preparation of Environmental and Social Implementation Reports to be submitted to the lenders (quarterly for the AfDB) and annual audits.

7 Conclusions

The Cabeolica Expansion Project at São Vicente will have overall limited levels of environmental and social impacts with a **COMPATIBLE** value for which the implementation of mitigation measures will further lower or eliminate the significance of impacts. Non-routine (major accidents and natural disasters) impacts were assessed, and their residual impacts were assessed following a risk assessment process. Assuming the implementation of proposed mitigation measures, the significance of all risk scenarios will be reduced to **MINOR** and **MODERATE** to **ALARP (As Low As Reasonably Practicable).**

The main anticipated impacts due to the Project will be minimised by implementing the proposed mitigation measures, which will be accomplished and monitored through the Environmental and Social Management Plan (ESMP).

The present Simplified ESIA accounts for the foreseeable potential environmental and social impacts of the São Vicente BESS component. Following GIIP and the Lenders Requirements, the level of detail presented in the assessment is commensurate and proportionate to those potential impacts and the risks identified along the environmental and social assessment process.