Simplified Environmental & Social Impact Assessment – Non-Technical Summary

CABEOLICA EXPANSION PROJECT – Component 5, Boa Vista, Cabo Verde

Cabeolica SA

Date: 28 February 2025

Report Document No. 06106-416041-47260-B-06-0028, Rev. D

Advisian
Worley Group

advisian.com

Disclaimer

This report has been prepared on behalf of and for the exclusive use of Cabeolica SA, and is subject to and issued in accordance with the agreement between Cabeolica SA and Advisian. Advisian accepts no liability or responsibility whatsoever for it in respect of any use of or reliance upon this report by any third party. Copying this report without the permission of Cabeolica SA and Advisian is not permitted.

COVID-19

Advisian is committed to providing the Services to you in a timely and professional manner. Advisian is also committed to ensuring the health and safety of all of its people and its Customers. The COVID-19 pandemic has caused us to modify our business behavior. This means that Advisian may only provide you with Services in a manner in which it deems safe. Advisian employees may provide some or all of the Services from their home and travel to business meetings or site may be affected. Advisian will take steps to mitigate any delays associated with the provision of Services to you but accepts no liability or responsibility for the delayed or non-performance of any Services caused by the modification of its behavior to ensure the containment COVID-19 or the health and safety of its people.

Company details

Worley Nederland B.V., trading as Advisian
Company Registration No.: 24301248

Wilhelmina van Pruisenweg 2
2595 AN Den Haag, The Netherlands
T: +31 88 625 7510

Report Document No. 06106-416041-47260-B-06-0028, Rev. DD
Document Title: Simplified Environmental & Social Impact Assessment – Non-Technical Summary
Document Subtitle: CABEOLICA EXPANSION PROJECT – Component 5, Boa Vista, Cabo Verde

Rev	Description	Author	Review	Advisian approval	Revision date
A	Draft version	AL, IM	JE	NZ/MSS	15.08.24
B	Final Draft version	AL, IM	JE	AJ / MSS	22.10.24
C	Final version after AfdB 2nd review	AL, IM	MSS	LP	14.11.24
D	Final version after AfdB 3rd review	AL, IM	MSS	LP	28.02.25

Table of Contents

1 Introduction 6

1.1 Project background 6

1.2 Technical team and elaboration time 6

1.3 Purpose and scope of the Simplified ESIA 7

2 Overview of the project 8

2.1 Project location 8

2.2 Project justification 8

2.3 Proposed technology and project components 9

2.3.1 BESS 9

2.3.2 Electrical connection 10

2.3.3 Site layout 10

2.4 Project phases, key activities, and schedule 13

2.5 Project footprint 13

2.6 Project alternatives 14

3 Environmental and social baseline conditions 15

4 Summary of main environmental and social impacts and risks 18

4.1 Environmental and social impacts of routine activities 18

4.2 Anticipated Non-Routine Impacts 21

4.3 Cumulative Impacts 22

5 Stakeholder consultations 24

6 Environmental and Social Management Plan 26

6.1 Mitigation measures 26

6.2 Monitoring Plan 28

6.3 Roles and responsibilities 35

6.4 Grievance Redress Mechanism 36

6.5 Reporting requirements and indicators 36

7 Conclusions 38

Acronyms and Abbreviations

Acronym	Definition
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
CMP	Camara Municipal
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
GBV	Gender-based-violence
GIIP	Good International Industry Practice
GRM	Grievance Redress Mechanism
HSE	Health, Safety and Environment
IUCN	International Union for Conservation of Nature
NGO	Non-Governmental Organization
OE	Owners Engineer
PCS	Power Conversion System
PPE	Personal Protective Equipment
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 the 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 the *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 Boa Vista (Component 5)**.

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 October 2024 and February 2025 by Advisian in coordination with, 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 –Boa Vista, 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. In addition, a reconnaissance visit was conducted in July 2024 to complement the description of the baseline conditions. 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 Boa Vista 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

The Cabeolica Expansion Project is in the Cabo Verde Archipelago. Component 5 is in the municipality of Boa Vista on Boa Vista Island, close to the AEB Parcela Power Station and approximately 8.3 km from the Boa Vista windfarm.

The project plot for Component 5, which belongs to the Government of Cabo Verde (*Direção Geral do Património do Estado*) (NIP 5500466730000), is detailed in **Error! Reference source not found.** and shaded in red in Figure 2-1, occupies an approximate area of 1,373 m^2.

. The exact location and boundaries of the Parcela BESS to be installed and the electrical connection in this plot is yet to be confirmed. The location of the electrical connection, which goes through the AEB power plant, is indicated in **Error! Reference source not found.**.

Figure 2-1 Location of Parcela site

The nearest village is Rabil, which is approximately 1.2km from the Parcela site to the east. However, the closest receptor is a horse stable (including a guard house) approximately 100 from the site to the south.

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 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 Boa Vista are listed in Table 2-1. External illustration of the battery container of the BESS is provided in Figure 2-3.

Table 2-1 BESS technical characteristics.

BESS Component	Capabilities
No. of installed BESS	1
Power Rating (MW)	6
Energy Capacity Rating (MWh)	6
Rate of discharge requirement	1C
Mode of operation	Spinning Reserve & ancillary services
Connection Voltage (kV)	20
Electrical connection	Underground MV cable of 50 m, connected to the existing Parcela substation
Battery container	(2x20'HQ) x 2 blocks

BESS Component	Capabilities
Battery type	Narada Batteries 76.8NESP200 (1C): 3696 kWh installed capacity x 2 blocks = 7392 kWh
Auxiliary system	Direct current distribution panel and alternating current panel, BMS, HVAC, fire system
PCS	SMA model SCS 3450UP. Rated apparent power (at 25ºC and 1200 V) 3598 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 20 kV 3-phase circuit to the existing AEB Parcela substation (approximately 60 m in total length with a minimum trench of 1.20 m). This electrical connection will be routed inside the perimeter of AEB's power plant, using cable trays in the walls and in the building's concrete roof slab, when necessary, although most of the cable will go underground.

2.3.3 Site layout

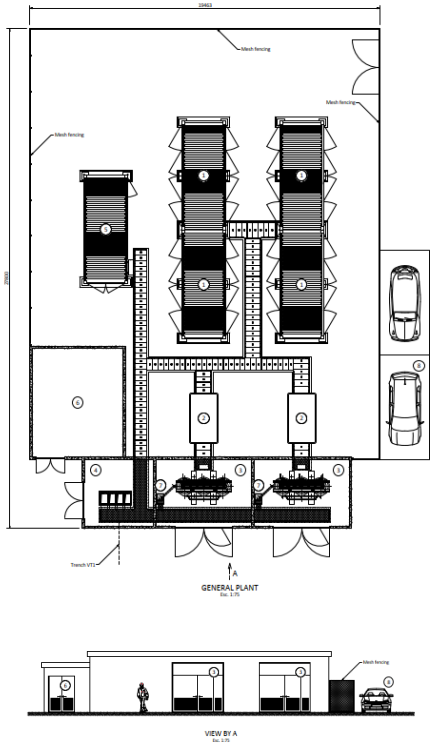
The layout for the Boa Vista BESS with two sets of containers is shown in Figure 2-4, which includes the following components for the BESS facility:

- 4 containerized battery modules
- 2 inverters (PCS)
- 2 step-up transformers
- 1 MV substation
- 1 LV room and Control house
- 1 warehouse of 30 m^2

- 2 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 2-4 BESS layout on Boa Vista Island



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

2.4 Project phases, key activities, and schedule

Project phases, key activities, and schedule of Cabeolica Expansion Project in Boa Vista (Component 5) 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 • Delineation and preparation of temporary work areas • 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: Less than** 60 m x 1.2 m ~72 m^2
PROJECT RESOURCES	Pre-construction, construction, and decommissioning	**Water for human 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, 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 Boa Vista, 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:** three potential sites that were preliminarily identified and evaluated for Boa Vista Expansion Project: Parcela Power Station, Lacacão Substation and Sociedade Substation. After considering the three locations, it was concluded that the location at Parcela will serve as a strategic storage point for several integrated substation and networks.
- **Technology alternatives:** Lithium-ion batteries were selected as the chosen energy storage technology option.
- **Electrical connection alternative:** An alternative going through AEB power plant boundaries was selected to avoid crossing a neighbouring private owned property.
- 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 very arid climate, low temperature range and it is under the influence of the Harmattan, with trade winds from November to May. Average annual temperature is approximately 24.4ºC. Dominant winds are from the northeast, reaching average speeds of 20 km/h.
Topography	The project area is a plateau with minor slope located in an industrial area.
Hydrography and groundwater	Evidence of surface water bodies and groundwater abstraction were not encountered in the surroundings of Parcela 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 Parcela site falls within an area of Holocene and Pleistoce sediments, represented by saline deposits, marine deposits from ancient beaches, consisting of limestones and calcarenites with maximum altitudes of 100-120m, sands, alluvium, beach gravels, dunes, fossil dunes, slopes and rushing deposits. The land is entirely within a dune area.
Air quality	The AEB energy production industry (power station) is the only static source of air pollution adjacent to the Parcela site. Two roads are adjacent tothe project area and constitute mobile sources: an access road to RIU hotels adjacent to the northern side of the site, and a dirt access road adjacent to the west side. The former is a source of vehicle emissions and the latter of dust particles from the passage of vehicles.
Noise	The main sources of noise are the AEB company (adjacent to site) and the Aristides Pereira International Airport in Rabil (400m east of the site). SA sensitive receptor (private land with a stable and a guard house) is approx. 100m south of the site.
Protected areas	The closest environmental protected areas are the Natural Reserve Boa Esperança, 1.4 km north of the site, and the Natural Reserve Morro de Areia, 2 km south of the site. In addition, the Parcela site is within the wider Important Bird Area (IBA) Ribeira do Rabil.
Flora	Vegetation coverage within the site is under 50%. Arboreous strata are represented by Acácia americana *(Prosopis juliflora)* (Least Concern as per IUCN Red List) and low coverage shrub and herbaceous strata represented mainly by *Lotus sp.*
Fauna	**Avifauna:** During the 2021 ESIA site visit, two (2) avifauna species were inventoried, both classified as Least Concern by IUCN: Cabo Verde sparrow (*Passer iagoensis*) and spectacled warbler (*Curruca conspicillata*). The first one is endemic to Cabo Verde. However, the Parcela BESS site does not support or contain habitat conducive to nesting or feeding for these species. **Reptiles and mammals:** The reptile community in Boa Vista is represented by three species, all endemic of Cabo Verde: *Chioninia spinalis,* Boavista leaf-toed gecko (*Hemidactylus boavistensis*) and Boavista wall gecko (*Tarentola boavistensis*). The latter is endemic to Boa Vista Island and classified as Vulnerable according to IUCN. Although their presence could not be confirmed during the 2021 visit, the site is within the geographic range of these species. Mammals are represented by one rodent species, *Mus musculus*, and one species of bats, *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

Site visit 2024

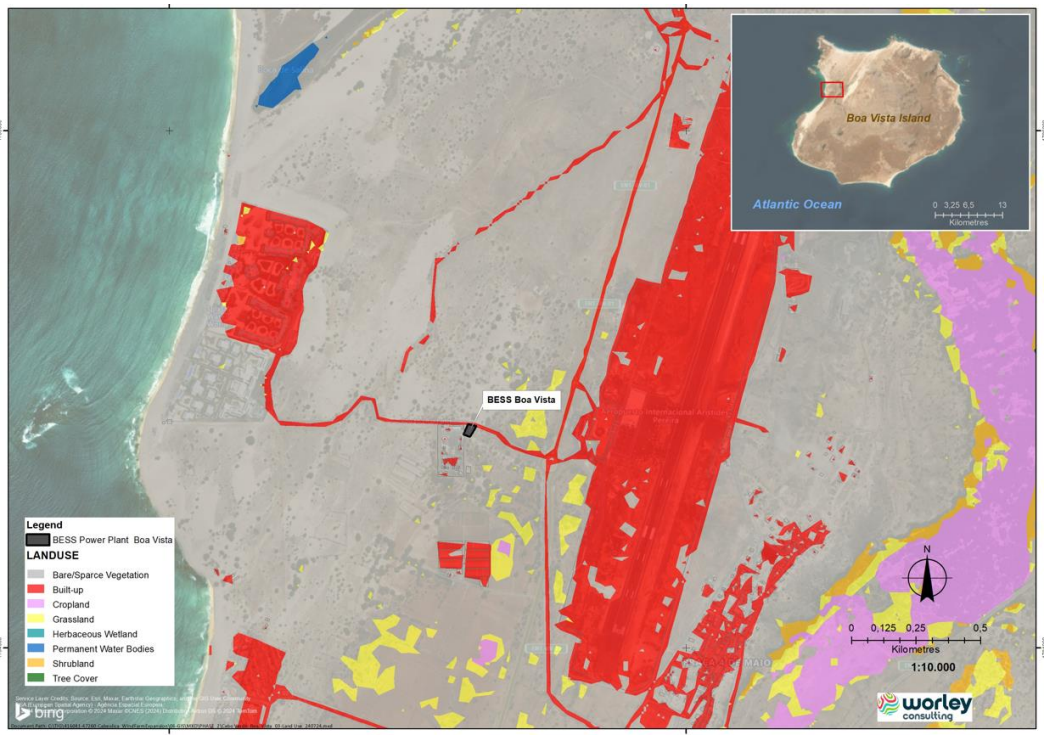
Table 3-2 Social Baseline conditions

Social Parameters	Baseline conditions
Population	Boa Vista has a population of 14,069 inhabitants. The Parcela site is in the municipality of Boa Vista, approximately 1.2 km from the village of Rabil, which has a resident population of 1,248 inhabitants. Two touristic resorts (Hotel RIU Karamboa and Hotel RIU Palace) are 0.8 km northwest of the site. A sensitive receptor (private land with stables and a guard house) is approximately 100m south of the site.
Health	Health infrastructures in Boa Vista consists in two health centers, one health station, five base health units and one health delegation.
Economy	Population in Boa Vista Island mainly lives in urban areas (86%) and depend on activities such as the tourism, the commerce and the construction. According to INE information, Boa Vista has a total of 15 hotels, which can accommodate approx. 260,000 guests and employ approx. 1,900 people. The island is characterized by a high unemployment rate (31.6%), which is higher than the total Cabo Verdean average (21%).
Infrastructure	The water for human consumption in Boa Vista Island is produced by AEB (public supply network) and supplies to the 61.3% of the population. The remaining population is supplied by neighbours, tankers, fountains or wells. On Boa Vista, the percentage of the population with a wastewater disposal system was about 11.1%, and the island has significance weaknesses in the sanitation sector. Access to electricity for illumination is 95.4% in the island, and most of the electricity is produced and distributed by AEB. Parcela site is in an industrial area adjacent to the AEB Parcela Power Station. The Rabil Airport is 400 m east of the site. Roads leading from the delivery Port (approximately 8 km route) are tar-sealed and support heavy vehicular traffic. The site area is in an aeronautical servitude associated with the Rabil Airport.
Land use	Currently, the Parcela site has no human occupation and has a surface cover of light shrub. The Project land area is categorized as an area with no specific use (natural spaces) by the Territorial Model Plan, and as Non-Buildable Area – Green Protection by the Municipal Master Plan.
Landscape	Obstacles that interfere with the visibility of the site are not present, 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 BESS site has no cultural heritage artefacts. However, the potential presence of cultural heritage is currently unknown.

Figure 3-2 Stables and guard house south of Parcela site

Site visit, 2024

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



4 Summary of main environmental and social impacts and risks

The Cabeolica Expansion Project in Boa Vista 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 Boa Vista.

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 Boa Vista 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 generator 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.

The installation of the BESS at the Boa Vista Parcela site will be limited to the areas occupied by the temporary work areas (200–300 m^2), the underground cables trench (less than 72 m^2, within AEB boundaries) and the module containers (maximum area of 735 m^2). Equipment and transport requirements for the new BESS at 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 minimal construction works required for the BESS components. However, given the proximity of the nearest valued receptor (stable and guard house approximately 100 m south) appropriate mitigation measures during construction activities will be carried out as per the ESMP.

The direct impact on flora is not expected to be significant because the site is in a modified habitat with low vegetation and the project footprint is reduced, and no sensitive floral species have been identified.

Regarding the impact on reptiles due to habitat loss, this impact will 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 Boavista leaf-toed gecko (*Hemidactylus boavistensis*) and Boavista wall gecko (*Tarentola boavistensis)* are potentially present –both species are endemic to Cabo Verde and the latter only to Boa Vista Island and classified as Vulnerable by IUCN- the impact on reptiles 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 Boa Vista 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.
- 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 Boa Vista are not expected to be significant given that pre-construction and construction works will be limited to the transport of the modules 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. However, given the close proximity of the nearest sensitive receptor (stables approximately 100 m south), the implementation of mitigation measures during construction is recommended as per the ESMP.

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. 100 m). The combination sources resulted in a total L_{eq} of 48 dB which is below the night noise limit set for mixed areas 55 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 AEB Parcela Power Station. Therefore, the BESS will resemble the

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

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.

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 s 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-0029) should 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 was 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).

Assuming the implementation of the mitigation measures described in Section 6.1, all risk scenarios were reduced to MINOR 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 Boa Vista. Other existing activities in the vicinities of the Boa Vista BESS site are summarized in Table 4-2.

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

Project/ Communities in the vicinity	Remarks
AEB Parcela Power Station	Located adjacent to BESS, west of the site location.
Aristides Pereira International Airport - Rabil	Located 400 m east of the site.
Riu Hotels	Hotel RIU Palace and Hotel RIU Karamboa, both located at approx. 800 m northwest of the site.
Nearby roads	• Access road to RIU Hotels located north from the site. • Dirt access road adjacent in the west side of the site.

Figure 4-1 Wall separating the Parcela site from the AEB station and unpaved access road

Site visit, 2024

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 Boa Vista BESS project

Valued Receptors	Cumulative impacts
Air Quality and Climate Condition	The air quality is affected by the presence of AEB Parcela Power Station, the Aristides Pereira International Airport and the circulation of vehicles on the road that connects the airport with touristic resorts. AEB Parcela Power Station is the most important contributor to the deterioration of local air quality, as a stationary source of nitrogen oxides (NO_x) and sulphur dioxide (SO_2), among others. The emissions from circulating vehicles (mainly NOx, CO and CO_2) on the road that

Valued Receptors	Cumulative impacts
	connects the touristic resorts with the airport are not expected to impact significantly on air quality at the Project site. 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.
Acoustic Environment (Noise)	The main sources of noise during 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 due to BESS sources of noise being 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 Parcela Power Station and the Rabil Airport. Considering the adoption of the proposed mitigation measures during operation, 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 project at Boa Vista and other developments in the area is expected to be limited due to the reduce scale of the project and 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 Boa Vista 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 the access roads to the touristic resorts is assessed to be COMPATIBLE.
Landscape	The overall impact on landscape by the Project at Boa Vista 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 in "Centro Arte e Cultura (CAC)" at Sal Rei, on August 2nd, 2024, at 15:30 (local time).

The objectives of the meeting 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 them representing companies or local authorities and institutions, as listed in Table 5-1.

Table 5-1 Attendees to stakeholder engagement meetings[3]

ATTENDEES	
Stakeholder category	Attendees
Primary stakeholders - Project affected people / communities	2 persons (*Águas e Energía de Boa Vista,* AEB)
Secondary stakeholders – National and local authorities and institutions	Sociedade de Desenvolvimento Turistico das Ilhas de Boe e Maio (SDTBM)
Secondary stakeholders – NGOs	Bios CV

In summary, the main topics were related to technical issues of the project, such as the expected lifetime of the batteries and the methodology to be followed with the waste produced during decommissioning of the batteries. Two concerns, which were related to a photovoltaic project on the island, and the changes produced that will occur in Electra, were not specifically related to the Project, so they and could not be properly answered during this meeting, as given that the Cabeolica's project only concerns the BESS project.

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.

[3] Names of individuals have not been included in the table due to data protection requirements.

For the Cabeolica Expansion Project, i.e. all five components, stakeholder engagement will continue following completion of the final Project Design and ESIA process as per Project SEP.

As part of post-design phase stakeholder engagement activities, prior to the start of EPC Construction activities, Cabeolica will arrange a meeting with the closest neighbour (the stable owner) to provide updated information regarding the project and provide the opportunity to submit comments or concerns. Any relevant comments received from the stable owner during this meeting will be addressed via the project ESMP.

6 Environmental and Social Management Plan

A Simplified Environmental and Social Management Plan (ESMP) was developed for the Cabeolica Expansion Project in Boa Vista 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 Boa Vista 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:

All Project Phases

- 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).
- Hold a meeting with the stable owner to inform about the BESS project and provide the opportunity to submit comments or concerns (MiG 2).
- 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 3).
- Implement the Cabeolica Expansion Project Waste Management Plan (Doc. No. 06106-416041-47260-B-0029). Update responsibilities, procedures, and compliance actions as required. (MiG 4).
- Once final design is finalized, confirm exact location of the BESS and electrical connection. Documentation providing compliance with E&S *Operational Safeguard 5 – Land Acquision, Restrictions on Access to Land and Land Use, and Involuntary Resettlement* will need to be presented before any works commence (MiG 5).

Pre-construction and construction phases

- 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 *Direção Geral de Agricultura, Silvicultura e Pequária* (DGASP) (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).
- Ensure that roads and accesses in the vicinity of project areas are not obstructed or in poor conditions. Ensure that an alternative access to the stable and the guard house is established (MiC 36).
- Conduct site restoration activities at the end of the construction phase (MiC 38).
- Implement Cabeolica's chance finds procedure (See Appendix E of the ESIA) which shall be in place during the pre-construction and construction phase to manage any potential chance cultural heritage finds. All site workers, including EPC workers, will also undergo training in chance finds procedures (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 Cabeolica Waste Management Plan (Doc. No. 06106-416041-47260-B-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 Pan (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 (MiN 20).
- Implementation of Cabeolica Expansion Project Waste Management Plan (WMP) (Doc. No. 06106-416041-47260-B-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.**Error! Reference source not found.**.

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 for monitoring
All	All impacts	MiG 1 MiG 2	MoG 1 Verification of Cabeolica Expansion Project SEP implementation during subsequent phases and verification of the additional meeting with the stable owner	-	**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.	Once prior to EPC construction works commencing. Continuous through construction activities and regular follow up during remaining phases	Cabeolica (MESA) EPC Contractor (HSE Manager)
	All impacts	MiG 3 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 4 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)
	All impacts	MIG 5	MoG 4 Verify that before commencement of any of the works documentation proving compliance with land acquisition requirements is submitted to the lenders	-	Final design location and permits/approvals for BESS and electrical connections	Permits/approvals obtained	Once prior to EPC construction works commencing.	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)

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility
		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)
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)
		MiO 2	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.	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 pre-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	Number of permits obtained in accordance with legal requirements.		Once after site preparation clearing/works	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)

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility
		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)
	Impact on flora and fauna due to the introduction of invasive flora and fauna alien species	MiC 18 MiC 22	MoC 17 Check origin of equipment and verify 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 7	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 SF_6 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

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
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. Quantities of waste (hazardous and non-hazardous) delivered per month (if any) and management operation to which they were subjected.	Production of updated plan.	Once, before the start of the decommissioning phase	Cabeolica (MESA), Vestas and BESS provider

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	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
		required per the job titles are provided and regularly inspected				
	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 Number of 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)

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 Cabeolica Expansion 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 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. 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.

During operation phase reporting will be part of Annual Environmental and Social Monitoring Report to be submitted to *Direção Nacional do Ambiente*.

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 Boa Vista 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 potential, relevant and significant impacts of the BESS facility and, in accordance with GIIP and the Lenders Requirements, the level of assessment presented is proportionate and limited to the potential impacts and risks identified along the process of the BESS installation, operation and decommissioning.