Simplified Environmental & Social Impact Assessment – Non-Technical Summary

CABEOLICA EXPANSION PROJECT – Components 1, 2 and 3, Santiago and Sal islands, Cabo Verde

Cabeolica SA

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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 Santiago and Sal islands (Components 1, 2 and 3)**.

The December 2022 submission of a national Screening Report to the National Environmental Impact Assessment (EIA) Authority, *Direção Nacional do Ambiente*, confirmed the project categorization for Components 1 to 3 in Santiago and Sal according to National Decree-Law No. 27/2020. These three components were categorized under **Category C**, which do not require a Full Environmental and Social Impact Assessment (ESIA) or public consultation but do require an environmental and social management plan as per Article 24 of the Decree-Law No. 27/2020.

1.2 Technical team and elaboration time

This Simplified ESIA was prepared between February 2023 and January 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.

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
Andrea Lázaro	Senior Environmental Consultant	Environmental Sciences, BSc, MSc, PhD	Advisian
Isabel Martínez	Senior Environmental Consultant	Environmental Sciences, 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.

The impact evaluation was supported by the completion of the following studies, the results of which informed the process of defining the mitigation measures:

- Noise and shadow flicker modelling assessment completed by Advisian (March 2024) using the software tool, WindFarmer 5.3.8, to update the predicted noise levels and shadow flickering effects in the area due to the Cabeolica Expansion Project phase in the Santiago windfarm due to the operation of the three new turbines (three location scenarios modelled). The assessment was updated in October 2024 incorporating an additional scenario with the final layout of confirmed by Vestas (Appendix A of the ESIA).
- Baseline surveys at the Santiago windfarm (flora, avifauna, reptiles, and bats) and the Sal windfarm (flora, avifauna, reptiles, and bats) in April 2023 (dry season), July 2023 (rainy season) and October and November 2023 (after the rainy season) by specialised subcontractors (Biosfera, Associação Projeto Biodiversidade and the University of Porto) (Appendices B, C, D, E, F, G & H of the ESIA).
- Visual assessment of Santiago windfarm conducted by Advisian (May 2024), considering the addition of 3 new turbines (Appendix I of the ESIA).

Furthermore, a Stakeholder Engagement Plan was prepared for the Cabeolica Expansion Project (Appendix J). Two stakeholder engagement meetings were carried out in Sal and Santiago islands 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.

2 Overview of the Project

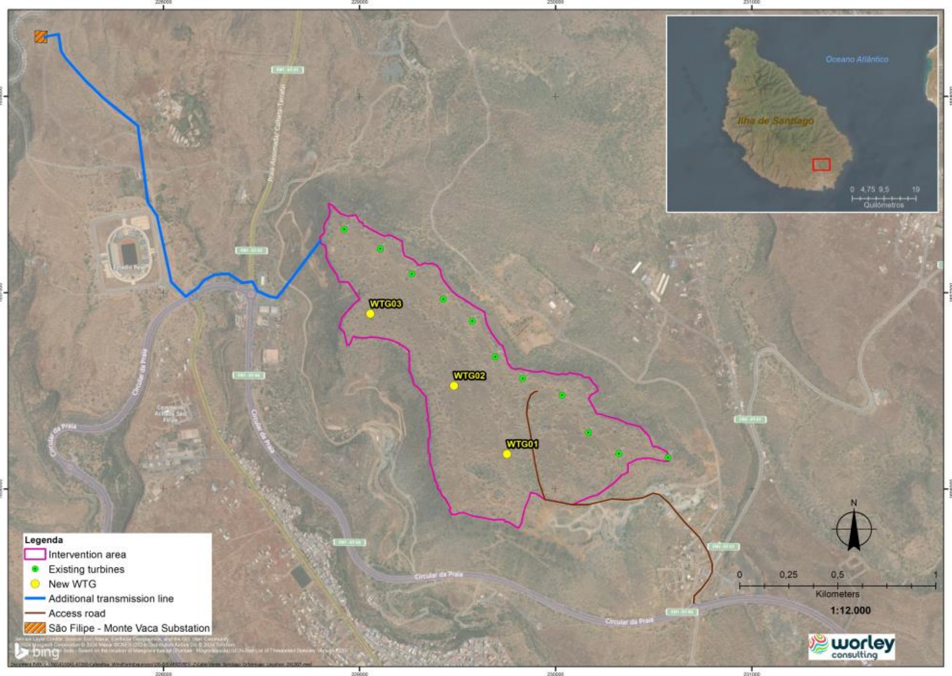
2.1 Project location

The Cabeolica Expansion Project is in the Cabo Verde Archipelago**. Components 1 and 2** will be carried out on Santiago Island and **Component 3** on Sal Island.

Santiago Island

The Santiago Windfarm is situated in the southeast of the island, 4 km from the city of Praia and 3 km from the village of São Francisco, in the Monte São Filipe, as shown in Figure 2-1.

Figure 2-1 Location of the Santiago Windfarm, access road and additional transmission line

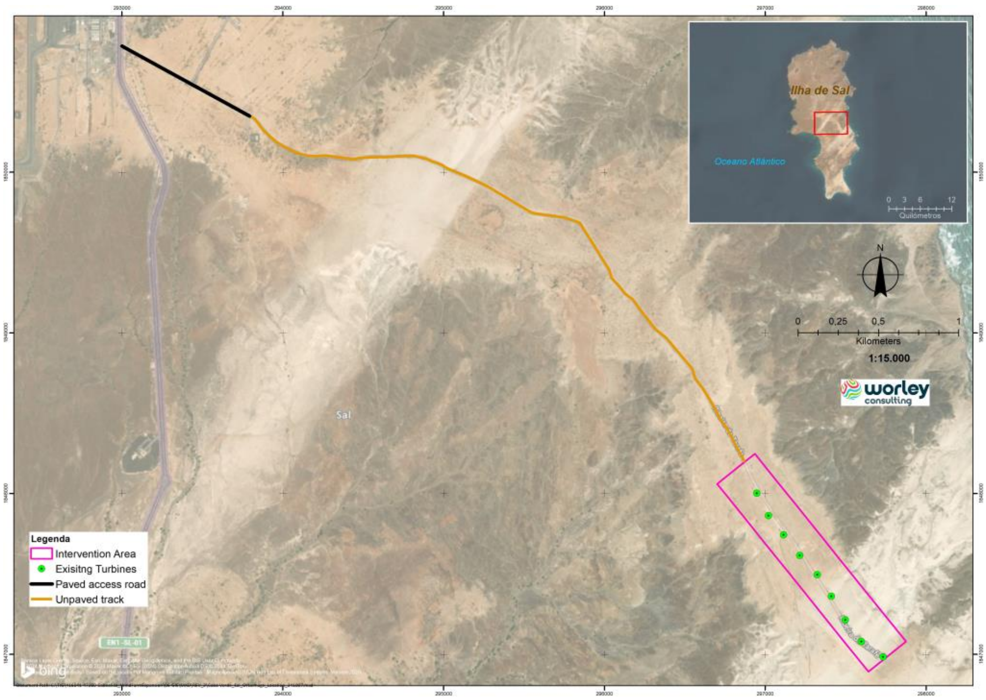


The transfer of the additional energy produced by the Santiago windfarm will **require an additional transmission line** connecting the windfarm with the Electra-owned substation (São Filipe, Monte Vaca), located outside of the windfarm boundaries approximately 2 km to the NE.

Sal Island

The Sal Cabeolica Windfarm is located in the Lajedo da Ribeira de Tarrafe region in the Eastern portion of the island, approximately 6 km from the town of Espargos and 10 km from the town of Santa María, as shown in Figure 2-2.

Figure 2-2 Location of the Sal Windfarm



2.2 Project justification

The Cabeolica Expansion Project is intended to reduce diesel spinning reserve operation by incorporating a BESS for the benefits of Cabeolica and the Transmission System Operator (TSO) to maximise renewable energy penetration and increase existing production capacity with the new wind turbines.

The renewable energy penetration rate of the two Cabo Verde islands will expand from around 20% (current) to around 50% (up to 70% maximum), enabling targets set by the Government for the sector to be reached by 2025.

Furthermore, it will significantly reduce the Cabeolica tariff and will save diesel fuel up to approximately 135 GWh per year, which will result in a net savings of up to 6 million euros (6M€) per year at a maximum of 70% SNSP (system non-synchronous penetration) at current fuel prices. The 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.

2.3 Proposed technology and project components

2.3.1 Wind Turbines

The characteristics of the new three wind turbines are provided in Table 2-1. The final layout for the three new turbines (WTG 01, WTG02 and WTG03) - subject to micro-siting - has been confirmed by Vestas (WTG Contractor) after conducting additional studies (i.e., preliminary geotechnical studies, confirmation of the choice of the turbine model, and site conditions data). The selected location is provided in Figure 2-3 and their coordinates in Table 2-2.

Table 2-1 Characteristics of the selected option for new turbines

WTG Characteristics	
Wind turbine model	Vestas V150 – 4.5MW
Installed capacity per WTG (kW)	4,500
No. of WTGs installed	3
Total installed capacity (MW)	13.5
Hub height (m)	105
Rotor diameter (m)	150
Tip height (m)	180

Figure 2-3 Examples of selected option for wind turbines

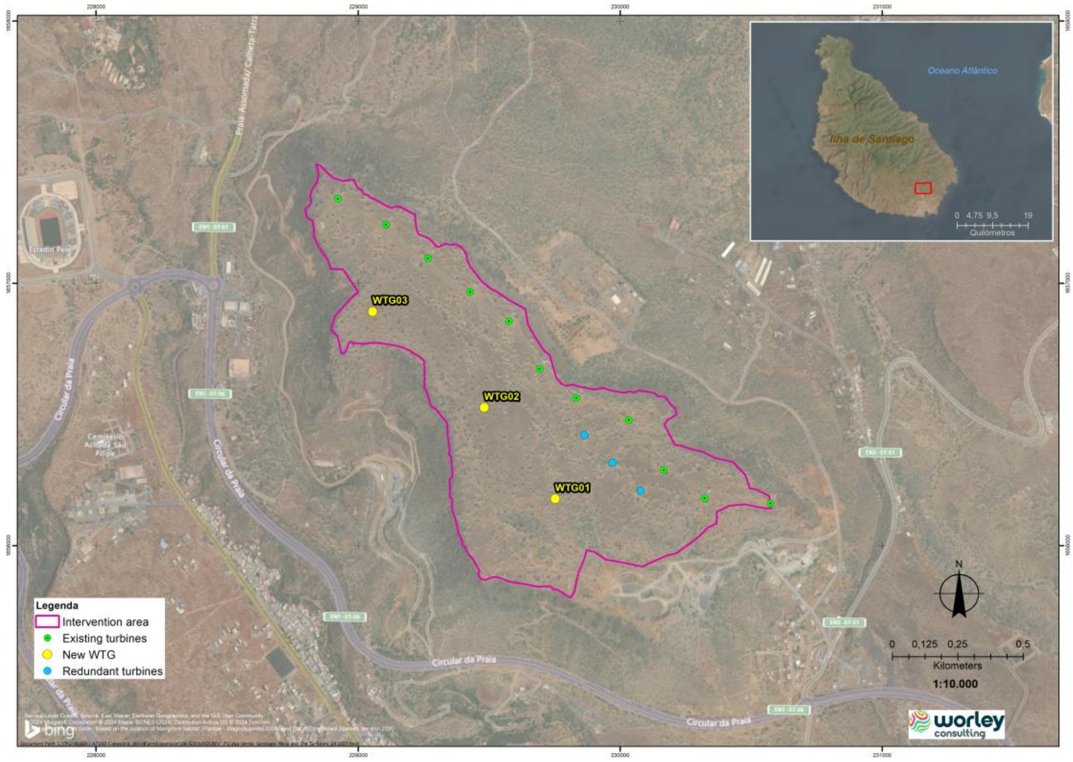


Table 2-2 Coordinates of new turbines (WTG 01, 02 and 03)

WTG	UTM (north) WGS84 Zone 27		Geo-WGS84		Min. distance to operational turbines	Min. distance to redundant turbines
	Easting (m)	Northing (m)	Latitude	Longitude		
WTG01	229753	1656179	14.966747	-23.512657	400 m	245 m
WTG02	229481	1656527	14.969862	-23.515224	260 m	400 m
WTG03	229055	1656893	14.973123	-23.519221	290 m	935 m

2.3.2 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 containers (20'HQ containers), each with their respective cooling system. For every two battery containers, a container with power converters, BESS SCADA, and switchgears will be implemented alongside outdoor LV/MV (Low Voltage / Medium Voltage) transformers.

The main technical characteristics of the BESS system in Santiago and Sal are listed in Table 2-3. An external illustration of the battery container of the BESS is provided in Figure 2-4.

Table 2-3 Main technical characteristics of the BESS

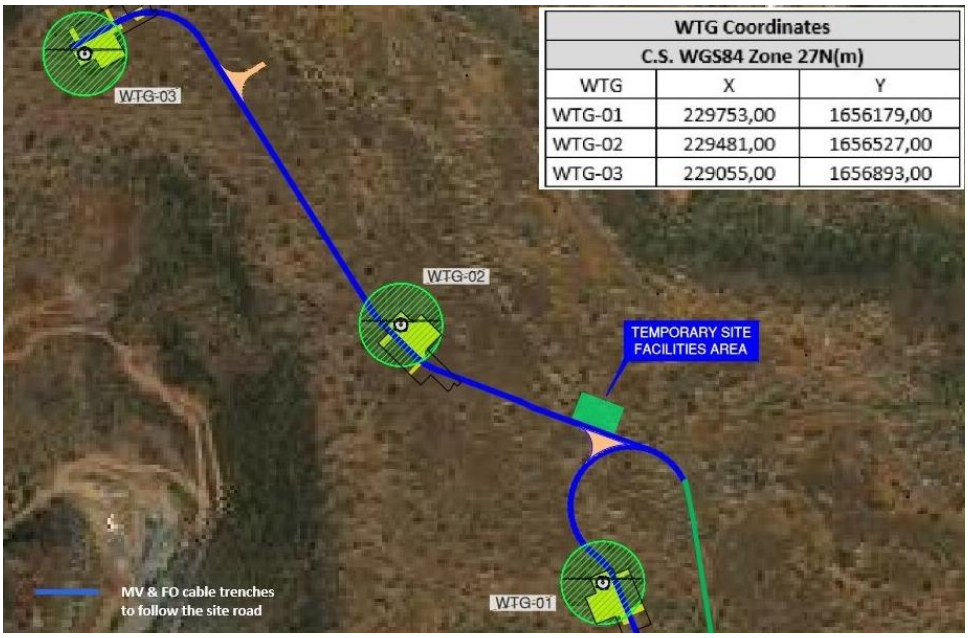
BESS Component	Santiago	Sal
No. of installed BESS	1	1
Power Rating (MW)	6	6
Energy Capacity Rating (MWh)	6	6
Rate of discharge requirement	1C	1C
Mode of operation	Ancillary Services	Ancillary Services
Connection Voltage (kV)	20	20
Battery containers	Two (2) sets of 2x20’HQ containers	Two (2) sets of 2x20’HQ containers
Dimensions (per rack) (mm)	1000 x 938 x 2130	1000 x 938 x 2130
Battery type	Narada Batteries 76.8NESP200 (1C): 3696 kWh installed capacity	Narada Batteries 76.8NESP200 (1C): 3696 kWh installed capacity
Auxiliary system	Direct current distribution panel and alternating current panel, BMS, HVAC, fire system	Direct current distribution panel and alternating current panel, BMS, HVAC, fire system
PCS	SMA model SCS 3450UP-XT. Control system (EMS-PPC) and HMI	SMA model SCS 3450UP-XT. Control system (EMS-PPC) and HMI

Figure 2-4 External view of a battery container of a BESS

2.3.3 Electrical connection

The preliminary electrical design solution is to terminate the daisy-chained 20kV underground electrical cables of the new windfarm turbines to the existing Santiago Island windfarm substation, which provides access to the existing distribution system. Underground cabling between the turbines will follow the routing of the access track (site roads) to the extent practicable. The cable between WTG 01, WTG 02 and WTG 03 is shown in Figure 2-5.

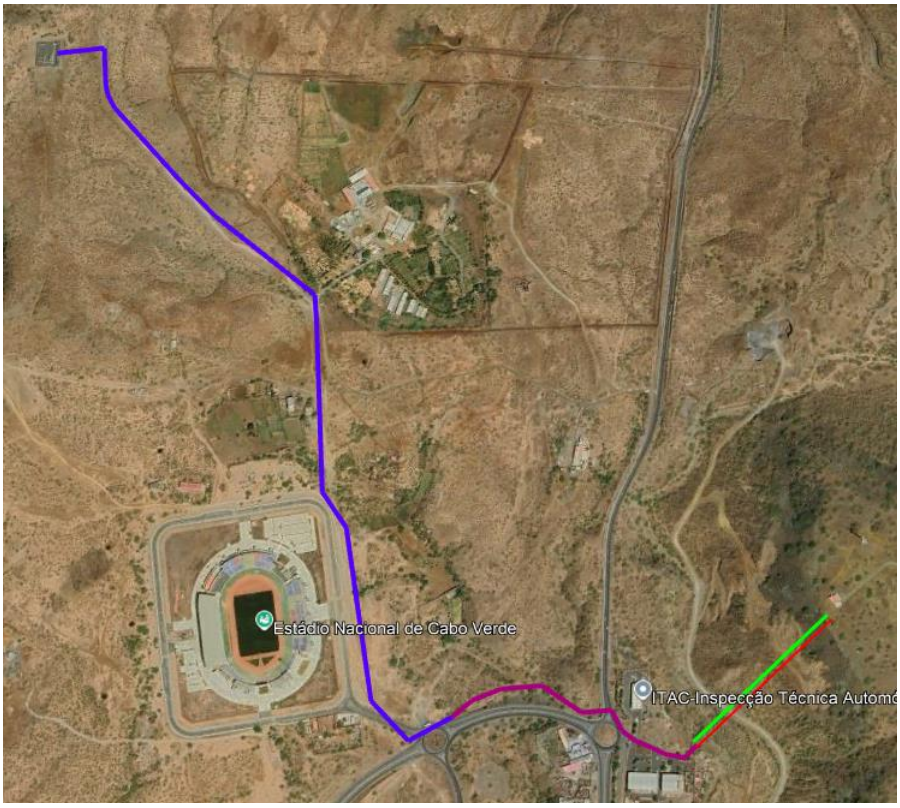
Figure 2-5 Cable to be laid underground between WTGs 01, 02 & 03



The BESS will be installed close to the wind substations to minimise cable length. Each BESS will require the installation of a single 20kV 3-phase underground circuit to the windfarm substation.

Furthermore, the Cabeolica Expansion Project in Santiago will require an additional 20kV transmission line, to be installed parallel to the existing interconnecting transmission/cable system. This additional transmission line will enable full power transfer from the Santiago windfarm to the TSO substation (São Filipe-Monte Vaca Substation).

Figure 2-6 Existing underground 20 kV network (purple and magenta) in Santiago and overhead segments (green new / red existing)



Two additional towers will be installed with the same configuration and dimensions of the existing towers, i.e., the same height, type of foundations, and transmission line configuration and are shown in Figure 2-7.

Figure 2-7 Anticipated locations of the additional towers in Santiago for the new parallel 20 kV overhead line

2.4 Project Phases, Key Activities and Schedule

Project phases, key activities, and schedule are summarized in Table 2-4.

Table 2-4 Key project phases and schedule

Project phase	Component	Main activities	Expected schedule
Pre-Construction	Component 1: New turbines at Santiago windfarm	• Detailed design and wind turbines layout • Procurement of all necessary equipment and materials for wind turbines installation • Site mobilization of personnel and equipment • Delineation and preparation of temporary work areas • Access to concrete source	Components 1 & 2: 5 months Component 3: 3 months
	Components 2 & 3: BESS at Santiago and Sal windfarms	• Detailed design and layout of BESS • 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	
Construction	Component 1: WTG at Santiago	• Installation of fences and gates • Completion of site grading • Construction of access roads to new turbines • Construction and installation of crane pads • Wind turbines slab foundations • Wind turbines erection and installation • Construction of an additional transmission line • Electrical and mechanical works: Installation of electrical infrastructure, e.g., voltage change transformers, HV cables, interfacing facilities for interchanging data (SCADA), CCTV system, telecommunication systems	Components 1 & 2: 10 months Component 3: 9 months
	Components 2 & 3: BESS at Santiago and Sal windfarms	• Completion of site grading • Civil works • Electrical and mechanical works	

Project phase	Component	Main activities	Expected schedule
	All components	• Environmental restoration and removal of temporary construction facilities	
Commissioning	All components	• Commissioning tests: electrical tests	1 month
		• Performance tests: WTG Reliability test, windfarm functional test and site acceptance test for containerized BESS	
Operation and maintenance	All components	• Operation throughout the use of automatic and remote-controlled means.	20 years
		• Routine maintenance of a wind turbine (40 hours per year), including turbine and rotor maintenance, parts lubrication, blade washing, electrical components maintenance and full generator overhaul.	
Decommissioning	Component 1: WTG at Santiago	• Turbines dismantling and removal • Foundation excavation and removal • Internal underground transmission line removal • Substation, warehouse, and guard house removal • Environmental restoration process • Access roads restoration	Components 1 & 2: 12-14 months Component 3: 6 months
	Components 2 & 3: BESS at Santiago and Sal windfarms	• Disconnection and isolation • Battery removal • Equipment removal • Environmental restoration process	

2.5 Project Footprint

Summaries of the project land use requirements and the project resource requirements and environmental aspects are provided in Table 2-5 and Table 2-6, respectively.

Table 2-5 Expected land requirements for each component

Project Component	Land Requirement (ha)
Santiago Windfarm	
Component 1: New WTGs	**WTG:** Each: 2,900 m^2 Total (3): 8,700 m^2 **Site tracks and underground cables:** 3,825 m^2 (850 m x 4.5 m) **Temporary site facilities:** ~2,500 m^2 (61.50 m x 38 m) **Permanent warehouse:** 65 m^2
Component 2: BESS	**BESS site:** 541 m^2 (27.8 m x 19.45 m), with potential expansion to ~735 m^2 **Temporary site facilities:** 200 – 300 m2 **Electrical connection:** 14 m^2 (14 m length x 1 m width)
New transmission line	**UG segment:** 2,270 m^2 (2,270 m x 1 m) **OH segment:** 40.5 m^2 (base 4.5 m x 4.5 m x 2 towers)
Sal Windfarm	
Component 3: BESS	**BESS site:** 541 m^2 (27.8 m x 19.45 m), with potential expansion to ~735 m^2 **Access road to site:** 15,000 m^2 (5000 m length x 3 m width) **Electrical connection:** 11 m^2 (11 m length x 1 m width) **Temporary site facilities:** 200 – 300 m2

Table 2-6 Project land requirements, resources and environmental aspects

Project Requirements	Project phases	Characteristics
PROJECT RESOURCES	Pre-construction, construction, and decommissioning	**Water:** supplied using trucks from local suppliers and stored onsite in tanks. **Raw materials:** Cement, concrete and raw materials (e.g., steel, stone, aggregate) will be sourced locally, generally, and transported to site. **Fuel:** Procured from local suppliers and transported to site. Stored in designated areas. **Power requirements:** onsite diesel generators.
	Operation	Nothing additional to existing operation requirements.
AIR EMISSIONS	Pre-construction, construction, and decommissioning	Dust and particulate matter (PM) Exhaust emissions (SO_2, NO_X, CO_2, and CO)
	Operation	CO_2 emissions (low)
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), municipal solid waste (paper, cardboard, plastic and other packages, food waste) and hazardous waste streams. **Specific decommissioning waste:** significant quantities of solid waste will be generated during the decommissioning of existing wind turbines and the expansion project components. Major pieces of equipment may be recyclable or reusable.
	Operation	Nothing additional to existing operation requirements.
NOISE	Pre-construction, construction, and decommissioning	Sources of noise equipment and machinery. Sound pressure levels 85-79 dB (A).
	Operation	Existing operation of 11 turbines, maximum noise level of 104.2 dB(A). The maximum noise level of each new wind turbine is expected to be 107.6 dB(A). Regarding BESS, sound power levels may range between 60-92.6 dbB. BESS noise sources will be enclosed, so emissions impacts will be reduced to acceptable levels.
WORKFORCE AND ACCOMMODATION	Pre-construction, construction, and decommissioning	50 workers (30 workers in Santiago and 20 in Sal) with accommodations in nearby communities.
	Operation	20 additional indirect workers (15 in Santiago and 5 in Sal)

2.6 Project Alternatives

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

An overview of the main choices made by Cabeolica after assessing the alternatives for the Expansion Project is provided in Section 3 of the ESIA and summarized below.

- **Site selection alternatives:** The existing windfarms are installed in "*Zonas de Desenvolvimento de Energias Renovaveis*" (ZDER), as per "*Plan Estrategico Sectorial de Energías Renovaveis*" (PESER), where it is permitted to locate renewable energy installations. The initial site viability assessment found that the sites met all relevant criteria for the development of a windfarm. Consequently, alternative sites were not considered for the proposed development that expands the existing Santiago and Sal windfarms.

- **Technology alternatives:**
  - Component 1 - Wind turbines: Configuration alternatives for three (3) or five (5) additional new turbines for the Santiago windfarm were considered. The most suitable option was determined to be the installation of 3 Vestas V150 4.5MW (105 m hub height), which are larger turbines than currently installed in the Santiago and Sal windfarms (Vestas V52-850kW, 55 m hub height1).
  - Components 2 and 3 - BESS: Based on an agreement between the Government of Cabo Verde, Electra S.A. and Cabeolica, the sizing of the BESS to be installed in the Sal and Santiago windfarms was calculated as the optimal solution for each windfarm.
- Finally, **the "no action" alternative,** understood as maintaining the current operation of Santiago and Sal windfarms without the three components of the proposed expansion, was considered.

[1] Hub height: Distance from the ground to the middle of the turbine's rotor.

3 Environmental and Social Baseline Conditions

Cabeolica Expansion Project – Santiago site (Components 1 and 2)

The geographical boundaries of the area of influence (both direct and indirect) for the Cabeolica Expansion Project in Santiago site 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 – Santiago site.

Environmental Parameters	Baseline conditions
Climate	The climate of the study area is under the influence of Northern hemisphere trade winds most of the year, and precipitation is common during humid months (August, September, and October). Average annual temperature is approximately 24.6ºC and average annual precipitation is 278.3 mm. Dominant winds are from the northeast, reaching average speeds of 19 km/h.
Topography	Project area is called Monte Filipe or Ilhéu de São Filipe, a plateau with average altitudes between 170 and 300 m and a minor slope (2% to 4%). Adjacent areas where the additional transmission line will be installed include lower elevation terrains through which the main streambeds flow into the city of Praia and numerous systems with considerable altitude.
Hydrography and groundwater	The headwaters of several streams in the area originate on the plateau where the windfarm is located and flow into valleys on the eastern side of São Filipe and to the west of the Project area. The additional transmission line will cross two of these valleys (Agua Funda and Sao Filipe) these streams have large flows during the rainy season. In the Project area of influence, several sources of water with high salinity due to intensive abstraction over time are used to provide water to some rural communities near Praia. Water table was not detected at the measurement points of the geotechnical assessment carried out by Advisian, which were at a depth of 9 m below ground level.
Geology and soils	Monte São Filipe and adjacent areas are covered by layers of volcanic rock, e.g., basalt and basanitoids. The soil profile of the Project area consists of a thin layer of pyroclastic deposits with dense compactness followed by the shallow presence of basaltic rock with few alterations. No concerning geohazards were detected in any of the exploration points of the geotechnical assessment carried out by Advisian.
Air quality	Local air quality is affected by two significant sources of atmospheric pollution: the ITP quarry south of the windfarm, and the Praia Traffic Ring. Both sources are south of the project area, which favors the dispersion of air pollutants emitted by both sources.
Noise	Other than the existing Santiago windfarm, noise sources include the ITP quarry south of Monte São Filipe. The nearest sensitive receptors (former Islamic Cultural Centre, two residential complexes, and a church) are approximately 1 km east of the proposed locations of the new turbines.
Flora	Flora on Santiago Island present steppe-like characteristics, interspersed with shrubby or tree vegetation with vestiges of denser formations that were gradually destroyed by successive droughts and the human pressure. Predominant flora is characterized by species typical of semi-arid and arid areas. Flora surveys covering the Santiago windfarm and 500 m buffer were conducted in 2023 (April, July, and October) with the following results: • 45 species are identified, of which two within the buffer zone of the windfarm are Endangered as per IUCN classification: Piorno-de-flor-amarela (*Helianthemum gorgoneum*) and Alegrin brabo (*Campylanthus glaber*). • 4 endemic species were encountered: Gestiba (*Cynanchum daltonii*), Alegrin brabo (*Campylanthus glaber*), Piorno-de-flor-amarela (*Helianthemum gorgoneum*), and Asparagus-pea (*Lotus purpureus*). Out of these four, Gestiba and Aspargus-pea were found within the windfarm. The OH segment of the additional transmission line will cross the 500 m buffer around the windfarm with the same characteristics described above, while the UG segment will cross an area occupied by built-up areas or sparsely vegetated areas.

Environmental Parameters	Baseline conditions
	None of the proposed components (roads, new WTGs, temporary facilities, the transmission line and the BESS site) are expected to be directly impacting any of the four sensitive species, particularly those endangered which are located at considerable distance from proposed interventions and are unlikely to be impacted.
Fauna	**Avifauna:** Avifauna surveys were conducted in the windfarm and 500 m buffer during 2023 (April, July, and October) with the following main conclusions: • Of the 16 species observed during the three surveys conducted in the windfarm and 500 m buffer, all were classified as Least Concern according to IUCN, and three were identified as endemic to Cabo Verde: Andorinhaão de CV (*Apus alexandri*), Falcão Falco (*Tinnunculus alexandri*), and Pardal de terra (*Passer iagoensis*). • Only one migratory bird was observed (Back Kite – *Milvus migrans*) during the dry season (April 2023) and its occurrence was considered to be occasional, possibly during migration to breeding / feeding areas. No nocturnal species were identified during the dry (April 2023) and rainy season (July 2023). Only after the rainy season owls were heard. • Three bird carcases of *Numida meleagris* and *Falco alexandri* were encountered in the windfarm site during the reptiles and bats monitoring survey conducted after the rainy season (October 2023). **Reptiles and mammals:** The Santiago windfarm is in an area of known distribution of 4 of 6 reptile species endemic on the archipelago. During 2023 surveys (April and October 2023), 4 species were identified (2 of them endemic) Santiago wall gecko (*Tarentola rudis*), Santiago skink (*Chioninia spinalis santiagoensis*), Delalande' skink (*Chioninia delalandii*) and Brook's house gecko (*Hemidactylus angulatus*). Another specie is pending genetic confirmation. Mammals are not abundant in the study area. Introduced toads were observed near the entrance gate. Three bat species were recorded previously: *Taphozous nudiventris*, *Plecotus austriacus* and *Pipistrellus c.f. kuhli*. During the survey carried out after the rainy season (October 2023), three bat carcasses with evidence of barotrauma and/or collision with the wind turbines were found within the windfarm site, all of them of the naked-rumped tomb bat (*Taphozous nudiventris)*. Other mammals (non-protected species), such as green monkeys, cattle, and goats, were observed within the windfarm boundaries in free roaming.
Protected areas	Protected areas are not located in the vicinities of Santiago windfarm and the new transmission line corridor. The closest protected areas are the RAMSAR site *Lagoaa de Pedra Badejo (*located 10 km northwest of the windfarm and 8 km from the Sao Felipe-Monte Vaca substation), and the *Natural Park Serra do Pico de Antonia* (located 5 and 7 km northeast of the São Felipe-Monte Vaca substation and the Santiago windfarm).

Figure 3-1 Alegrin brabo (Campylanthus glaber)(left)and Cabo Verde swift (Apus alexandri)(right), endemic species identified during Avifauna and Flora Survey, April and July 2023

Table 3-2 Social Baseline conditions – Santiago site.

Social Parameters	Baseline conditions
Population	Santiago Island is the most populated of the archipelago. Praia has 151,155 inhabitants, according to the 2022 census.
Health	Health infrastructures in Praia include 1 central hospital, 6 health centers, 1 reproductive health center, 1 health station, 6 base health units, and 1 health delegation. Agostinho Neto Hospital has about 400 beds serving the islands of Sotavento, Sal, and Boa Vista and providing national coverage in some specialties and services.
Economy	The population of Santiago mainly lives in urban areas (97%) and depend on activities such as repairing motor vehicles and domestic appliances (19.97%) and construction (12.32%). The rural area of Praia is characterized by a high rate of unemployment, a low level of education, and a high number of families without minimum resources.
Infrastructure	Access to electricity for illumination in the city of Praia is 92.2%, above the national average. 71% of the population has access to the public network of potable water. The route from the Port of Praia to the project site is ~8 -10 m wide and mostly tar-sealed, and the surface is in good condition with a shallow slope of ~ 4 km from the port to the airport roundabout. From the airport roundabout to the large roundabout, 1 km southeast of the site, the topology changes over a ~3 km road section; however, the road is tar-sealed, and the surface appears unbroken. The road from the large roundabout to the site is a combination of broken sealed and dirt track that is currently unsuitable for heavy loads.
Land use	The project land area is currently used as the Santiago windfarm in a ZDER, according to the Sectorial Strategic Plan for Renewable Energies (PESER). The land is pasture for cattle and goats, which feed on most plant species in the area. The areas adjacent to the windfarm is part of a national reforestation program. As for the corridor of the additional transmission line, except for the OH segment which will extend above grassland and shrubland areas, the UG route will pass through areas that are mainly occupies by built-up areas and area sparsely vegetated.
Landscape	The Santiago windfarm area has visual quality because the location and altitude enable good visibility from Praia. The visual impact of the existing windfarm was mitigated by using adequate colours for turbines and buildings.
Cultural heritage	According to the previous ESIA (2009), the Santiago windfarm area lacks historical or archaeological value. Declaration nº 11/GP/2023 by the Institute of Investigation and Cultural Heritage confirmed visible cultural evidence was not found in Cabeolica windfarms, including Santiago site. The potential presence of cultural heritage along the additional transmission line cannot be excluded.

Cabeolica Expansion Project – Sal site (Component 3)

The geographical boundaries of the area of influence (both direct and indirect) for the Cabeolica Expansion Project in Sal site has been identified in the Simplified ESIA. for all environmental and social aspects. The following tables summarize the environmental and social conditions for the Sal site.

Table 3-3 Environmental Baseline conditions – Sal site.

Environmental Parameters	Baseline conditions
Climate	Sal Island is one of the most arid of the archipelago. The climate of the study area is influenced by Northern hemisphere trade winds most of the year, and precipitation is rare during the humid period, which has high rates of evaporation. Average annual temperature is 23.8ºC and average annual precipitation is 102.9 mm. Dominant winds are from the northeast, reaching average speeds of 24 km/h.
Topography	Project area is a plateau (flattened platform) with altitudes between 60 and 70 m and minor slope (1% and 2%) in almost 90% of the area. Adjacent areas are at lower altitudes with minor slopes (between 1% and 2%).
Hydrography and groundwater	Several streams originate in the windfarm area with very low flow volumes. There are no wells or groundwater in the Project area that can provide significant quantities.
Geology and soils	Soils are generally caused by basaltic formations and contain limestone, are of fine and medium textures, and contain a base saturation level of more than 50%. Soil layer is frequently interrupted by rocky, non-consolidated material or covered by a thin sand layer.
Air quality	The municipal landfill of Espargos, north and upwind of Lajedo da Ribeira de Tarrage, burns solid waste in the open air. Access roads are compressed dirt, but the reduced volume of traffic is not a significant source of atmospheric pollution.
Noise	The Project area is an arid zone without nearby sensitive receptors. Nearest municipalities are Espargos (2,5 km from the beginning of the unpaved access road and 7km from the windfarm km) and Murdeira (5 km from both points).
Flora	Flora in Sal Island present steppe-like characteristics and is very scarce, mainly with short-cycle species tolerant to high levels of aridity and salinity. Two surveys conducted in 2023 (April and November) found 37 species in April (dry season) and 42 in November (rainy season), of which 8 are endemic to Cabo Verde and 10 are under special national protection (Decree-law no. 8/2022, April 6th, Annex I). Out of the 10 sensitive species, only one was found in the proposed BESS location: *Sueda caboverdiana*, although with low coverage (less than 30%) and found with greater abundance in other areas of the windfarm, compared to other endemic species found present within the windfarm.
Fauna	**Avifauna:** During the 2009 ESIA, the presence of 3 avifauna species was noted, 2 of which were identified as endemic to Cabo Verde, the Falcão Falco (*Tinnunculus alexandri*) and the *Passer iagoensis* (considered abundant). Five bird carcases of *Pandion haliaetus* and *Falco alexandri* were found while monitoring reptiles and mammals in October 2023. **Reptiles and mammals:** Project area is within the distribution area of Sal skink (*Chioninia spinalis salensis*), a Near Threatened taxon unique of this island, and the probability of occurrence of the Sal leaf-toed gecko (*Hemidactylus boavistensis chevalieri*) is low. Two surveys conducted in 2023 specifically for reptiles and bats (April and October) confirmed the presence of Sal skink (*Chioninia spinalis salensis*) and the absence of Sal leaf-toed gecko (*Hemidactylus boavistensis chevalieri*), both inside and outside the windfarm area. The presence of introduced *H. angulatus* and *Hemidactylus mabouia* geckos was confirmed by genetic analysis during the October survey. There was no evidence of bats in the study area. The three cats observed during the April 2023 survey, a common predator of reptiles, birds, and other animals, could by why reptiles are not found in the project area.
Protected areas	Protected areas are not located in the vicinities of Sal site. The closest protected areas are the Natural Reserve *Serra Negra (*3 km south of the windfarm), the Marine Natural Reserve *Baia da Murdeira* (4 km west of the windfarm) and the Protected Landscape *Salinas Pedra Lume e Cagarral* (6km north of the windfarm).

Figure 3-2 Carqueja (Limonium brunneri) (left) and Lotus (Lotus brunneri) (right), both endemic species, identified during Flora Survey, April 2023

Table 3-4 Social Baseline conditions – Sal site

Social Parameters	Baseline conditions
Population	Sal Island has 35,480 inhabitants according to 2022 census, 95.6% of which is concentrated in urban areas.
Health	Health infrastructures on Sal Island comprise 1 regional hospital (Hospital do Sal in Espargos), 1 health center, 1 base health unit, and 1 health delegation (in Santa María).
Economy	Migration in search of employment in sectors such as civil aviation and tourism is the main reason for the population growth on Sal Island. This growth on migration has resulting in social problems, particularly in Santa Maria, such as consumption and trafficking of drugs, prostitution, and other illegal activities. Around 95% of the population live in urban zones, and most are employed in the hotel and restaurant industry (22% of total population). Only 4% of the Sal population is employed in agriculture, while 30.4% of the Cabo Verde population works in agriculture. Sal Island is generally characterized by relatively low unemployment compared with the national average.
Infrastructure	Access to electricity for illumination in Sal Island is 93.7%, above the national average. 81.7% of the population has access to the public network of potable water. Road/track access to the Sal windfarm area comprises two distinct sections: (a) tar-sealed roads leading from the delivery Ports that support heavy vehicular traffic, and (b) low grade gravel and dirt tracks closer to and on the Site.
Land use	The Project land area is currently used for the Sal windfarm in a ZDER area, according to the Sectorial Strategic Plan for Renewable Energies (PESER). There are no agricultural activities in the surroundings. Occasionally, the land is used to discharge solid waste from construction activities.
Landscape	The location and altitude of the Sal windfarm enable good visibility from various locations on the island and along the road that connects Espargos with Santa Maria. Visual impact of the existing windfarm was mitigated using adequate colours for the turbines and buildings.
Cultural heritage	The Sal windfarm area lacks historical or archaeological value. Declaration nº 11/GP/2023 by the Institute of Investigation and Cultural Heritage confirmed visible cultural evidence was not found in Cabeolica windfarm. However, the potential presence of underground cultural heritage within the Sal windfarm site and along the 5km unpaved access road cannot be excluded.

4 Summary of main environmental and social Impacts and Risks

The Cabeolica Expansion Project in Santiago and Sal 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 both islands.

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 Santiago and Sal 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 50 workers (30 workers in Santiago and 20 in Sal) and 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,** 2 direct jobs and 15 indirect jobs will be required in Santiago, and as for Sal, job opportunities will be limited to five indirect jobs. The latter workers will be sourced by the BESS supplier 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).

During **operation**, the increased capacity and storage after installing the BESS will contribute to fuel savings and improved decarbonization factors. New turbines will also contribute to increasing the capacity of the existing windfarm and will continue contributing to reduced CO_2 emissions compared to power generation from fossil fuels.

Table 4-1 Summary of positive impacts of the Cabeolica Expansion Project – Santiago and Sal sites

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

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

Negative impacts

None of the negative impacts were assessed to be CRITICAL prior to the implementation of mitigation measures (i.e., above acceptable thresholds that would imply a permanent loss of environmental conditions without recoverability regardless of corrective measures) nor SEVERE (i.e., requires corrective measures to return to original conditions and recoverability period is medium- or long-term). The potential impacts assessed as MODERATE (i.e., does not require intensive preventive or corrective measures and the period needed to return to original conditions is not long) before the implementation of mitigation measures for routine project activities are summarized in Table 4-2 and Table 4-3 for Santiago and Sal windfarms, respectively.

Following mitigation recommendations included in Section 6.1 and adhering to best practices will reduce adverse environmental impacts during routine operations from MODERATE to COMPATIBLE.

Table 4-2 Summary of residual impacts at Santiago Windfarm

Project phase	Valued Receptor	Impact	Valued Receptor Assessment	Impact Significance	
				before Mitigation	after Mitigation
Pre-construction and Construction	Flora	Direct removal or damage to vegetation	MEDIUM	MODERATE	COMPATIBLE
	Reptiles and Mammals	Impact on fauna due to habitat loss	MEDIUM	MODERATE	COMPATIBLE
	Infrastructure	Effects on local infrastructure and increased traffic	MEDIUM	MODERATE	COMPATIBLE
Commissioning, Operation and Maintenance	Avifauna	Impact on avifauna and bats due to potential collision	MEDIUM	MODERATE	COMPATIBLE
	Reptiles and Mammals	Impact on avifauna and bats due to potential collision	MEDIUM	MODERATE	COMPATIBLE
	Population	Impact on local communities due to shadow flicker effects	MEDIUM	MODERATE	COMPATIBLE
	Landscape	Change on the visual perception of landscape	MEDIUM	MODERATE	COMPATIBLE
Decommissioning	Infrastructure	Impact on waste infrastructure due to waste generation	MEDIUM	MODERATE	COMPATIBLE

Table 4-3 Summary of residual impacts at Sal Windfarm

Project phase	Valued Receptor	Impact	Valued Receptor Assessment	Impact Significance	
				before Mitigation	after Mitigation
Pre-construction and Construction	Infrastructure	Effects on local infrastructure and increased traffic	MEDIUM	MODERATE	COMPATIBLE

The results of the residual impacts assessment indicate that following mitigation recommendations and adhering to best practices all adverse environmental impacts during routine operations will be reduced to COMPATIBLE and no foreseeable residual impacts should remain.

For the Cabeolica Expansion Project in Santiago site, impacts *Impact on avifauna due to potential collisions* and *Impact on bats due to potential collisions* during commissioning, operation and maintenance phases, should be reassessed after post-construction monitoring has been completed.

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:

- Blade throw during the operation of wind turbines in Santiago Island: MINOR Risk
- Fire and explosion accidents: HIGH Risk
- Accidents / Collision of vehicles: MODERATE Risk
- Leaks and spills of hazardous substances and waste: MODERATE Risk
- Occurrence of flash floods in Santiago Island: HIGH Risk
- Risk of collapse of the old non-operational wind turbines in Santiago site: MODERATE 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 considered the impacts due to the Cabeolica Expansion Project in Santiago and Sal. Other existing activities in the vicinities of the windfarms are summarized in Table 4-4.

Table 4-4 Activities and infrastructures in the vicinities of Santiago and Sal windfarms

Windfarm	Project in the vicinity	Remarks
Santiago	Indústria Transformadora de Pedras - CCV – Central de Betao 340	Quarry to obtain blocks and aggregates for civil construction, located south of the windfarm, 0.25 km from WTG11
	Circular da Praia (Praia traffic ring or roundabout)	Main highway of the island. It surrounds the wind farm from the west and the south
Sal	Municipal landfill of Espargos	Landfill where soil waste is burned daily. Located 5 km north of the windfarm
	Amílcar Cabral International Airport	Located 5 km northwest of the windfarm.

The results of the assessments of the main cumulative impacts at both sites of Cabeolica Expansion Project are summarized in Table 4-5. Cumulative impacts of the Project were assessed as COMPATIBLE in all cases.

Table 4-5 Cumulative Impacts for the Santiago and Sal Expansion Phase

Valued Receptors	Cumulative impacts
Air Quality and Climate Condition	The air quality of the **Santiago site** is affected by the presence of suspension particles due to quarry activities, but the prevailing winds blow from NW to SW, and these airborne particles are not expected to contribute significantly to decreased air quality in the Project area. The air quality in the **Sal site** area is affected by emissions due to the burning of urban waste in the municipal landfill of Espargos, which are dispersed toward the Sal windfarm. Considering the short duration of construction activities (estimated in 10 months in Santiago and 9 months in Sal), and the mitigation measures to be implemented to reduce this impact, the significance of the cumulative impact on air quality and climate condition is assessed as COMPATIBLE.
Acoustic Environment (Noise)	Contributors to noise levels in the **Santiago site** are the quarry and traffic of the Circular da Praia. Cumulative effects during construction activities in both the **Santiago and Sal sites** are not expected to be significant given the short duration of construction activities. During operation, the modelling results for the addition of three WTGs in the Santiago windfarm indicate that the combined noise levels of the new turbines and the existing turbines will be within national limits, irrespective of the location configuration of the new WTGs. The BESS is not anticipated to emit significant noise pressure because it is comparable to noise emissions from electrical substations 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,
Flora and Fauna	The overall impact on habitat loss and the connectivity of ecosystems by the proposed Cabeolica Expansion Project in Santiago and Sal and other developments in the areas is expected to be limited because the Cabeolica Expansion Project will take place within the boundaries of the Santiago and Sal windfarms or parallel to the existing transmission line.
Local economy	The Cabeolica Expansion Project is expected to increase the renewable energy penetration rates of the two Cabo Verde islands from approximately 20% (current) to approximately 50% (up to 70% maximum). 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	Considering typical traffic activity in both islands, the cumulative effect could be significant. However, given that this activity will be limited to pre-construction (estimated in 5 months in Santiago and 3 months in Sal, but only during the transport of the three WTGs and two BESS) and construction (estimated in 10 months in Santiago and 9 months in Sal). Assuming that the proposed mitigation measures are implemented, the significance of the cumulative impact on infrastructure is assessed to be COMPATIBLE.
Visual impact	The overall visual impact by the Cabeolica Expansion Project in Santiago and Sal combined with other developments in the area will be limited given that the new WTGs in the **Santiago site** will be installed within the boundaries of the existing windfarm and with the implementation of the proposed mitigation measures.

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, two stakeholder engagement meetings were carried out:

- Santiago Island: Auditório BAI Center, Praia, on May 31, 2024, at 15:30 (local time), and
- Sal Island: Biblioteca Municipal, Espargos, on June 5, 2024, at 14:00 (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 meetings were attended by different stakeholders, most of them representing companies or local authorities and institutions, as listed in Table 5-1 and Table 5-2.

Table 5-1 Attendees to Santiago stakeholder engagement meetings[2]

ATTENDEES - Santiago Island meeting (Praia)	
Stakeholder category	Attendees and organisations represented
Secondary stakeholders – National and local authorities and institutions	*Camara Municipal da Praia* (CMP) *Direção Nacional do Ambiente* (DNA) National Directorate for Industry, Commerce and Energy (DNICE) Instituto de Seguranza e Saúde Ocupacional (ISSO)
Secondary stakeholders – Universities and centers of investigation	Etecnica
Secondary stakeholders – NGOs	ONG Biosfera 1
Secondary stakeholders – Other stakeholders	Ilidío Cruz e Associados, Cabeolica legal representative United Nations Industrial Development Organization (UNIDO)

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

Table 5-2 Attendees to Sal stakeholder engagement meetings[3]

ATTENDEES - Sal Island meeting (Espargos)	
Stakeholder category	Attendees
Primary stakeholders - Project affected people / communities	2 persons
Secondary stakeholders – National and local authorities and institutions	*Câmara Municipal da Sal* (CMS) *Direção Nacional do Ambiente* (DNA) Aguas de Ponta Preta (APP) Ordem de Engenheiros de Cabo Verde
Secondary stakeholders – NGOs	Associação de projeto de biodiversidade
Secondary stakeholders – Other stakeholders	Electra Mario Chantre Construção

In summary, the main discussion topics were related to the beneficial impacts of the project, mostly beneficial social impacts, such as the possibility of hiring local personnel and the improvement of nearby areas due to Project implementation. Attendees representing national institutions, such as DNA or DNICE, asked about technical issues regarding the general project with a focus on the BESS and their use and capacity, as well as suggested improvements to the Simplified ESIA with additional information regarding the associated costs of the environmental and social management plan.

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

As part of post-design phase stakeholder engagement activities, prior to the start of EPC Construction activities, Cabeolica will hold a second consultation event in Santiago to inform local communities regarding the project and provide project affected people/ communities opportunities to submit comments. This consultation event will follow the same approach as for the ESIA i.e. to focus on presenting an overview of the project, the ESIA process, key findings, impacts, and mitigation etc. Any relevant comments received from the community during the consultation event will be addressed via the project ESMP.

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

6 Environmental and Social Management Plan

A site-specific Simplified Environmental and Social Management Plan (ESMP) was developed for the Cabeolica Expansion Project in Sal and Santiago 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 Santiago and Sal that were evaluated as having a significance of MODERATE can be reduced to a significance of COMPATIBLE by following a series of recommended mitigation measures. In addition, following these recommendations could further lower or eliminate the significance of impacts assessed as having a significance of COMPATIBLE.

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).
- Hold one additional consultation event in Santiago to inform local communities close to Santiago windfarm regarding the project and provide the community opportunities to submit comments (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-06-0029). Update responsibilities, procedures, and compliance actions as required. (MiG 4).

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

- Limit construction activities to demarcated areas and follow pre-defined transport routes (MiC 12).
- 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 (MiC 19).

- Use information from the field surveys on the distribution of sensitive species to reduce impacts to the extent possible on these receptors, particularly in the case of endemic, Endangered and Critically Endangered species (MiC 20).
- Use existing accesses and transport corridors whenever possible (MiC 21).
- Minimise the removal of native plant species and, if unavoidable, promote replanting native plant species in disturbed areas. Minimise the removal of native plant species and, if unavoidable, promote replanting native plant species in disturbed areas. Based on initial survey results, the number of species affected will be quantified using GIS information and quantities and type ground verified by spot checking by the EPC Contractor. Applicable permits should be obtained if species categorized as Endangered or Critically Endangered by the IUCN Red List or endemic species are to be removed, in compliance with Decree-Law No. 8/2022 of April 6th, which establishes the conservation and protection measures for endangered flora and fauna species in Cabo Verde (MiC 22).
- Check the origin of equipment and materials used on site (MiC 23).
- Implement invasive species management procedures, including cleaning of equipment, prior to shipping to site (MiC 24).
- Avoid locations, to the extent possible, where evidence of important fauna concentrations has been observed during field surveys. Before initiating construction activities, ensure that the maximum number of reptiles, mammals, and ground nesting birds are removed, if encountered, 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 26).
- Promote environmental awareness of biodiversity by placing outdoor posters of flora and fauna on the outside of windfarm buildings. (MiC 27).
- Design waste management procedures to prevent the attraction of fauna by appropriately managing food waste in work areas and in and around temporary offices. (MiC 30)
- Minimise the generation of light during the night-time to avoid attracting fauna and causing potential deviations from migration routes (MiC 31).
- 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 34 and MiC 36).
- Promote the use of a local workforce whenever possible and practicable to do so (MiC 35).
- 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 37).
- 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 40).
- Develop a logistics, traffic, and transportation plan that covers the transportation of heavy components using specialist transportation vehicles (Santiago) as well as materials for the improvement of access roads (Sal) (MiC 41).

- Ensure that roads and accesses in the vicinity of project areas are not obstructed or in poor conditions (MiC 42).
- Implement Cabeolica's chance finds procedure which shall be in place during 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 45).

Commissioning, Operation and Maintenance

- Conduct post-construction monitoring for avifauna and bats twice per year (once each season) at least during the first three years to confirm the impact of both existing turbines and the newly added larger capacity turbines. Based on the results, assess the need to conduct periodic monitoring to obtain data for periodic collision risk assessments (MiO 5).
- Avoid artificially creating features in the environment that could attract birds and bats to the wind energy facility, such as water bodies, perching or nesting areas, novel feeding areas, and/or roosting habitats. Cap or repair cavities in walls or buildings to remove potential bat roosting sites on building facilities under their control (MiO 6).
- Use "raptor safe" designs for power line poles to reduce electrocution risk, such as appropriate insulating material on phase conductors (MiO 7).
- Install bird flight diverters on transmission lines and guy wires from meteorological masts to reduce bird collisions (MiO 8).
- If required, program wind turbines to shut down when shadow flicker limits are exceeded (exceedances of 30 hours per year and 30 minutes per day at the sensitive receptor locations on the worst affected day) (MiO 12).
- Maintain a uniform design of turbines (e.g., colour and type of tower) (MiO 15).
- Minimise the presence of ancillary structures on the site by minimising site infrastructure, including the number of roads, and by burying collector system power lines (MiO 16).

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 SF6 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 Pan (HSP) for all facilities (MiN 1).
- Document and report each non-routine event and accident that occurs. Cabeolica to notify Lenders no later than 72 hours after the occurrence of non-routine event or accident. In the event of a severe EOHS risk or incident works will be suspended and only should be resumed upon no-objection of

the Lenders. A root-cause analysis (RCA) of any fatal EOHS incident shall be prepared along with a Corrective Action Plan (CAP) (MiN 2).

- 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 11).
- Provide fire and explosion protection, suppression and relief equipment, and suitable personal protective equipment (PPE) (MiN16).
- 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 17).
- Ensure driver safety training are provided and verify driver qualifications (MiN 18).
- Vehicles and other equipment shall be subjected to regular maintenance and inspections to avoid spills and leakage of fuels and lubricants (MiN 21).
- Design site drainage (during construction and during operation) to account for the likely Storm Event Intensity for the area (MiN 30).
- Alignment with Cabo Verde Emergency Preparedness and Response Plan (MiN 31).
- Deviate the access route from the old wind turbine locations (MiN 32).
- Liaison with owner of old the non-operational wind turbines to re-assess their stability and encourage their decommissioning (MiN 33).

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 mitigation measure, the proposed monitoring measures, the indicators and evidence of implementation, the monitoring frequencies, 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 for monitoring
All	All impacts	MiG 1 MiG 2	MoG 1 Verification of additional consultation event in Santiago and 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	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 28 MiN 29	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 for monitoring
Air Quality	Decreased air quality and impact on climate change	MiC 1	MoC 4 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 5 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 6 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 7 Verify dust/combustion pollutants reduction strategies	Site construction areas and access roads	Volume of water used for irrigation (m^3)	Irrigation records	Daily during construction	EPC Contractor (HSE Manager)

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
		MiC 7			Percentage (%) of vehicles/machinery serviced as per maintenance procedures	Equipment and vehicles maintenance/inspection records		
		MiC 2 MiC 3 MiC 4 MiC 5 MiC 6	MoC 8 Passive sampling of dust/combustion pollutants (NO_2, SO_2, O_3, PM_{10} and $PM_{2.5}$)	At sensitive receptors in Santiago site: - 2 passive sampling units in sensitive receptors close to Santiago Windfarm (e.g. Residential complex 1 and 2) - 2 along UG segment of additional line	Maximum concentrations (hourly and daily) registered per parameter Percentage (%) of exceedances of permitted limits (IFC limits, in absence of national limits)	Passive sampling records	During construction: - Combustion pollutants: 2 campaigns (15 to 30 days per campaign) - Dust: 4 campaigns (15 to 30 days per campaigns)	EPC Contractor (HSE Manager)
Acoustic Environment	Increased ambient noise levels	MiC 8 MiC 10	MoC 9 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)
		MiC 9	MoC 10 Undertake noise measurements before construction starts and during civil works along the UG segment of the additional transmission line	At selected sensitive receptors in Santiago site, along UG segment of additional transmission line	Number of increases of > 3 dB above baseline (the adoption of mitigation measures will be analyzed on a case-by-case basis)	Noise measurement records	Once before construction activities and during civil works along UG segment of additional transmission line	EPC Contractor (HSE Manager)
		MiO4	MoC 11 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 11 MiC 12 MiC 21	MoC 12 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 13 MiC 19	MoC 13 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 19	MoC 14 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 to legal requirements	Permits obtained (when applicable)	Once, before construction activities	EPC Contractor (HSE Manager)
	Direct removal or damage to vegetation Impact on fauna due to habitat loss	MiC 20 MiC 26	MoC 15 Verify that initial site surveys results (dry and rainy seasons) are used to minimize impact on areas were important sensitive fauna and flora concentrations were observed	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	Once, before construction activities	Cabeolica (MESA) EPC Contractor (HSE Manager)
		MiC 22 MiC 25 MiC 26	MoC 16 Verification of removal of species categorized as Endangered or Critically Endangered Species by the	Site construction areas and access roads	Number of permits obtained in accordance with legal requirements	GPS location of species to be removed		Cabeolica (MESA) EPC Contractor (HSE Manager)

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
			IUCN Red List and endemic species (where applicable)			Permits obtained (where applicable)		
		MiC 22 MiC 26	MoC 17 Verification of relocation of flora and 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 and after site preparation clearing/works	Cabeolica (MESA) EPC Contractor (HSE Manager)
		MiC 22 MiC 26	MoC 18 Verification of site restoration measures and re-colonisation of areas affected by construction activities	Site construction areas and access roads	Surface of areas restored vs planned	HSE inspections records Photographic records	Once, at the end of construction	Cabeolica (MESA) EPC Contractor (HSE Manager)
		MiC 27	MoC 19 Verify that outdoor posters of flora and fauna are placed outside windfarm buildings	Windfarm buildings	Number of posters posted outside buildings and location	Posters Photographic records	Once, before the start of operation	Cabeolica (MESA)
	Disturbance to fauna	MiC 30	MoC 20 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 31	MoC 21 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 32	MoC 22 Verify implementation of safe speed limits and driving through pre-defined routes	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 23 MiC 28	MoC 23 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)
	Impact on avifauna and bats due to potential collision	MiO 6	MoC 24 Check that artificial features that could attract birds and bats to the energy facility are avoided	-	Number of cavities cap or repaired in facilities/buildings under their control	Final design Photographic records	Once during pre-construction, with final design	EPC Contractor (HSE Manager)
		MiO 7 MiO 8	MoC 25 Verify that "raptor-safe" designs and flight diverters are used on overhead transmission lines to reduce bird collisions and electrocution risks	-	Number of "raptor-safe" designs and flight diverters adopted on overhead transmission line	Final design Photographic records	Once during pre-construction, with final design	Cabeolica and Transmission Line Provider
Hydrology & groundwater	Decrease in surface and groundwater quality	MiC 16	MoC 26 Verify that excavation and soil movement are avoided in the proximity of water courses	Site construction areas and access roads	Distance of earthwork activities to nearest water courses (> 50m)	HSE inspections records Photographic records	Daily during site preparation clearing/civil works	EPC Contractor (HSE Manager)
Demand of project resources	Demand of natural resources for construction materials Demand of water resources	MiC 14 MiC 15 MiC 17	MoC 27 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)

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
Population and Local Economy	Impact on local communities due to: - noise, dust, and air pollution - influx of construction workers and job seekers	MiC 34 MiC 36	MoC 28 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 37 MiC 38	MoC 29 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 34 MiC 35 MiC 39	MoC 30 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 40	MoC 31 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 41	MoC 32 Verify that a logistics, traffic and transportation plan is developed	-	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 42	MoC 33 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	Cabeolica (MESA) EPC Contractor (HSE Manager)
Landscape	Change on the visual perception of landscape	MiC 44 MiO 15 MiO 16	MoC 34 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 45	MoC 35 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.	Windfarm boundaries	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	Windfarm boundaries -	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-off when not in use.	Windfarm boundaries	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 (wind turbines)	MiO 2	MoO 5 Undertake measurements to verify that noise during operation is below applicable noise limits.	At selected sensitive receptors in Santiago close to windfarm boundaries	Number of exceedances of noise limits (National Law 34/VIII/2013, of July 24th)	Noise measurement records	Once every five years, as part of Annual Windfarm monitoring	Cabeolica (MESA)
	Increased ambient noise levels (BESS and general O&M activities)	MiO 3	MoO 6 Verify appropriate equipment and vehicles operation and maintenance	Windfarm boundaries -	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	Impact on avifauna and bats due to potential collision (wind turbines) Disturbance to fauna	MiO 5	MoO 7 Verify that post-construction monitoring campaigns are conducted twice a year for avifauna and bats during the first three years of operation	Winfarm boundaries + 500 m buffer	Number of surveys completed Number of carcasses found and species affected	Monitoring reports	Twice a year (one per season) during first three years of operation	Cabeolica (MESA)
		MiO 9 MiO 10	MoO 8 Verify that light during nighttime is minimized to avoid fauna attraction	Windfarm boundaries -	Lux levels used during night in compliance with final design and legislation	HSE inspections records	Regular follow-up during this phase	Cabeolica (MESA)
		MiO 11	MoO 9 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.	Windfarm boundaries -	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	Impact on local communities due to shadow flicker effects (wind turbines)	MiO 12	MoO 10 Verify that, when required, wind turbines are shut down when shadow flicker limits are exceeded at the sensitive receptor locations on the worst affected day	-	Number of close-out complaints received related to shadow flicker effects are equal to No. of complaints received	Grievance forms Grievance register Monitoring records	Regular follow-up during this phase	Cabeolica (MESA)

Valued Receptor	Impact	Mitigation measure	Monitoring Measure	Monitoring Location(s)	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
	Creation of employment, skills development, and business opportunities	MiO 14	MoO 11 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. 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 15 MiN 18	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)

Non-routine event	Mitigation measure	Monitoring Measure	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
	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)
	MiN12 MiN 22	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)
Blade throw during WTG operation (Santiago)	MiN 10	MoN 8 Verify that regular maintenance and monitoring is conducted for operating WTG	Percentage (%) of WTG serviced as per maintenance procedures	Maintenance records Incidents records	Continuous during operation	Cabeolica (MESA)
Fire and explosion accidents	MiN 11 MiN 14	MoN 9 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 13	MoN 10 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 16	MoN 11 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)
	MiN 17	MoN 12 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 18	MoN 13 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 19 MiN 20	MoN 14 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 21	MoN 15 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 23	MoN 16 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 24 MiN 25	MoN 17 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 26 MiN 27	MoN 18 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)

Non-routine event	Mitigation measure	Monitoring Measure	Indicator	Evidence	Monitoring Frequency	Responsibility for monitoring
Occurrence of flash floods	MiN 30	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 31	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)
Risk of collapse of the old non-operational wind turbines (Santiago windfarm)	MiN 32	MoN 21 Verify that traffic is deviated from the access route close to the old wind turbine locations	Number of complaints or warning notices issues by HSE Manager	Warning notices issued	Once before construction phase and monthly follow-up during this phase	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 at the Santiago and Sal windfarms. 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 windfarms and the BESS.

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 ESAP 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) of Cabeolica will establish the terms of reference to be observed in terms of environmental and social management of the Project, considering the applicable legal requirements, the ESAP 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, formal articulation with the various official entities involved in the process and implementation of the Grievance Redress Management Mechanism (GRM) to receive and process complaints related to the Project.

- EPC Contractor: The EPC Contractor awarded the contract to design, deliver, and install the Expansion 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 ESAP, depending on the specificities of its organization and the human and material resources that will be assigned to the work. The revised ESAP 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 (CCESMP).

- Owner's Engineer (OE): The activities that the OE will oversee will include, among others, assisting Cabeolica in the procurement of goods, 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 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.

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 classified by Cabeolica's MESA who determines, on a case-by-case basis, how to examine and respond to suggestions, concerns, and complaints. If the grievance is classified as Low (internally manageable), Cabeolica will be the responsible for the management of the grievance. On the other hand, if the grievance is classified as Medium or High (in both cases it is required advice / inputs from GRM Committee), Cabeolica MESA will raise the grievance to the GRM Committee for further discussion and resolution. Grievances are 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 ESMP 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 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

In summary, several relevant impacts from routine operations and non-routine events were identified by the Simplified ESIA. The main anticipated impacts due to the Cabeolica Expansion 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 Project. 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.