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e do Fomento Empresarial  
Unidade de Gestão  
de Projetos Especiais

## **UNIDADE DE GESTÃO DE PROJECTOS ESPECIAIS**

RENEWABLE ENERGY AND IMPROVED UTILITY PERFORMANCE PROJECT

# **Environmental and Social Assessment (ESIA) of the use of photovoltaic energy in Furna's ZDER**

**TA for the formulation of the Brava Sustainable Island  
Project**

Prepared for: PASER: Renewable Energy Sector Support Programme  
Updated for: RENEWABLE ENERGY AND IMPROVED UTILITY PERFORMANCE (REIUP)

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## LIST OF ABBREVIATIONS

ACP	Abbreviated Compensation Plan
BESS	Battery Energy Storage Systems
CCEFCF	Canada Clean Energy and Forest Climate
DNA	National Directorate for the Environment
DNICE	National Directorate of Industry, Trade and Energy
DNOT, EROT, PEOT	Land Use Plans
E&S	Environmental and social
EIA	Environmental Impact Assessment
EIAA	Environmental Impact Assessment Authority
EPC	Engineering, Procurement and Construction
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
EHSGs	Environmental, Health and Safety Guidelines
ESHS	Environmental, Social, Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
GBV	Gender-Based Violence
GIF	Global Infrastructure Facility
GovCV	Government of Cabo Verde
GRM	Grievance Redress Mechanism
IBRD	International Bank for Reconstruction and Development
ICIEG	Cape Verdean Institute for Gender Equality and Equity
IDA	International Development Association (World Bank)
INDC	the Intentional Nationally Determined Contribution
LGRM	Local Grievance Redress Management Committees

LMP	Labor Management Plan
MWp	Megawatts Peak
NGO	Non-Governmental Organization
OE	Owner's Engineer
OHS	Occupational Health and Safety
PCAS	Environmental and Social Commitment Plan
PDM, PDU, PD	Urbanistic Plans
PDO	Project Development Objectives
PDSE 2018-2040	Master Plan for the Electricity Sector
PESA	Preliminary Environmental and Social Assessment
PESER (in Portuguese)	Sectoral Strategic Plan for Renewable Energy
PV	Photovoltaic
SEP	Stakeholder Engagement Plan
UGPE	Unidade de Gestão de Projectos Especiais (Special Projects Management Unit)
UNESCO	United Nations Educational, Scientific and Cultural Organization
VAC	Violence Against Children
ZDER (abbreviation in Portuguese)	Fogo's Renewable Energy Development Area
ZDTI	Integral Tourism Development Areas
ZRPT	Tourism Reserve and Protection Areas

## EXECUTIVE SUMMARY

This document summarizes the environmental and social assessment of the implementation of a photovoltaic power plant (production of electricity using solar energy) in Furna, in the Municipality of Brava, Brava Island, in Cabo Verde.

This plant will be implemented in the scope of the so-called “Cabo Verde Renewable Energy and Improved Utility Performance Project”. This Project is being developed in line with the country's commitment to increase the production and coverage of electricity from renewable energy resources. For that purpose, the Government of Cabo Verde has obtained support from the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA/World Bank), Canada Clean Energy and Forest Climate (CCEFCF) and the Global Infrastructure Facility (GIF) to implement the Project.

The Component 1 ("Renewable and Efficient Electricity Service") of the Project will fund investments to integrate variable renewable energy sources into the grid and provide sustainable and resilient electricity solutions to public health facility buildings. Within this component, Subcomponent 1.1 ("Integration of small-scale renewable energy") will support the construction of small-scale solar power plants, their connection to the grid, as well as the installation of pilot energy storage facilities. The Brava photovoltaic plant is part of this subcomponent of the Project.

The implementation of the Project will be done by the Unidade de Gestão de Projectos Especiais (Special Projects Management Unit - UGPE).

The Project will also finance similar photovoltaic plants to be implemented in the islands of São Nicolau, Fogo, Santo Antão and Maio and the installation of battery systems for the storage of electricity in the five target islands.

### **Location of the solar PV plant**

The plot of land for which it is planned to use the solar resource (production of electric energy by photovoltaic technology) in Brava has a total area of about 5.8 hectares and is in the Northeast of the island, approximately 3 km from the village of Furna, in the Municipality of Brava.

The area where the land is located is served by an access road, with cobblestone pavement which connects to national road EN3-BR-01, Nova Sintra / Furna.

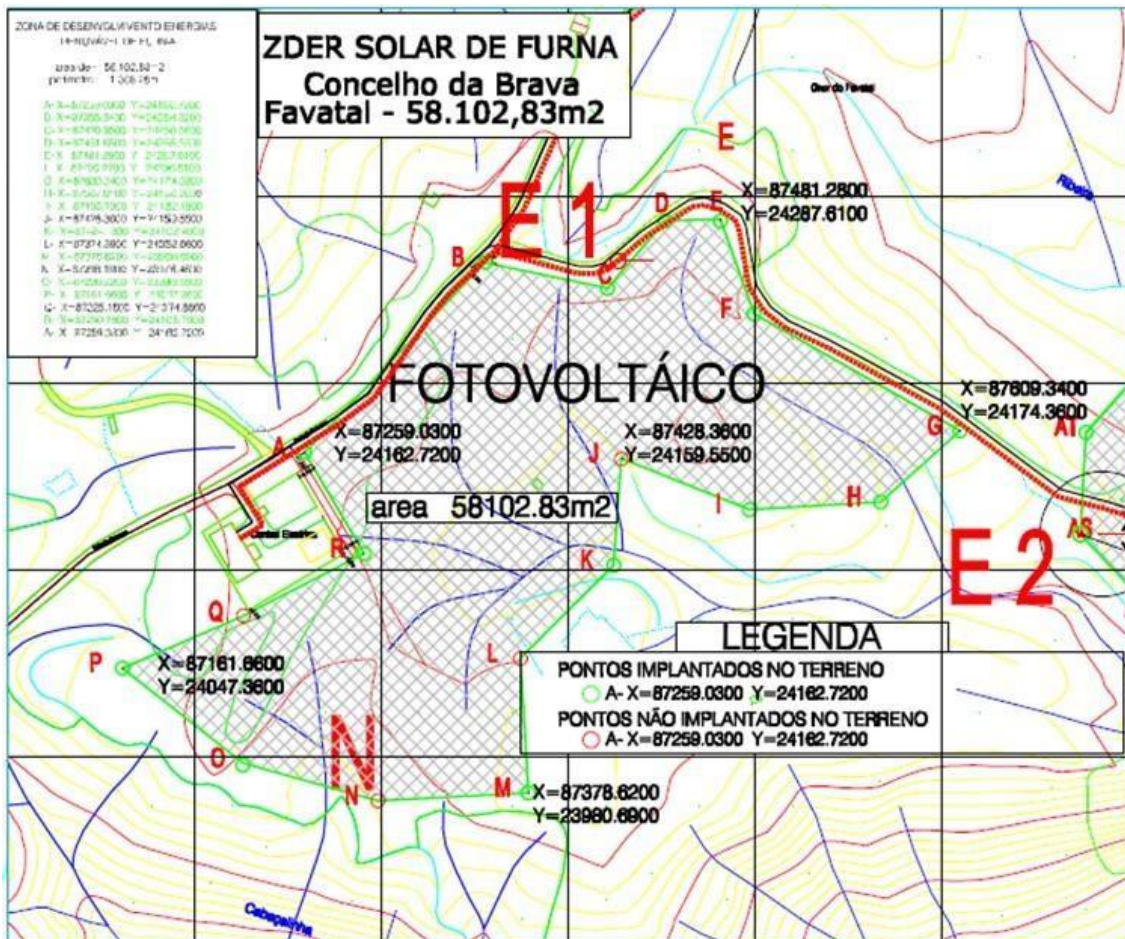


Figure 1 - Location of the planned solar PV plant

This figure also shows the planned route for the interconnection between the ZDER and the public grid for the distribution of electricity produced.

### Description of the solar PV power plant

The generators of electrical energy are the photovoltaic panels. These are installed on metal structures that have been designed in such a way as to maximize the solar radiation on the site (south-facing).



*Photo 1 - Solar PV panels and support structure set in concrete blocks (Sal Island)*

The electricity generated in the photovoltaic panels will need to pass through specialized equipment (inverters and transformers) before it is injected in the existing electrical grid of the island.

The electricity produced in the photovoltaic park will be drained in medium voltage (20 kV) through a very short connection, to the Favatal thermal power plant which is adjacent to the ZDER. It is planned that this connection will be made by buried cable in a dedicated trench to be opened for this purpose.

The solar PV plant will have a small technical building, with a footprint of approximately 50 m<sup>2</sup>. This building will in principle be constructed of concrete and masonry and will be used to house the solar PV plant's control and management systems and the medium voltage equipment, which will interconnect to the public electricity grid.

The entire facility will be designed, installed, and operated to comply with applicable international standards and national regulations.

The main aspects of the construction of the solar PV plant can be summarized as follows:

To support the works, a construction yard will be assembled inside the perimeter of the plant. It will include containers as usual in similar works, with a small meeting room and a support area for the staff, namely sanitary facilities, and a storage area for tools and some materials.

One of the characteristics of this type of project is that the structures for mounting the panels can reasonably adapt to the morphology of the terrain. Therefore, it is not expected that the creation of the photovoltaic plant may involve major earth movements (landfills, excavations). Foreseeable civil construction works include mainly:

- The preparation (cleaning, regularization, construction of the septic tank) of the area for the installation of the construction yard.
- The installation of a fence.
- The creation of access paths within the land.

- The creation of drainage ditches on the perimeter of the fenced area and along the access paths.
- The regularization of the land in the area where the panels and the technical building will be installed. It is expected that the earth movements to be carried out will not generate excess soil to be deposited outside the perimeter of the photovoltaic plant, nor will it require the importation of soil from borrow areas located outside this perimeter.
- The opening of trenches to install electrical cables inside the solar PV plant.
- Driving piles into the ground or installation of concrete blocks for the foundation of the metal structures for fixing the panels.
- The assembly of the metallic structures.
- The laying of the electric cables in the trenches.
- The installation of the electrical equipment.
- The construction of the technical building, in concrete and masonry.
- The construction of concrete bases for the installation of the inverters.
- Opening the foundations, placing the poles, installing the equipment, and laying the cables to connect to the existing medium voltage line.

For the execution of this work, a variety of machinery will be used, including excavators, concrete mixers, and transport vehicles for equipment and materials.

The assembly of the solar photovoltaic collectors essentially consists of the mechanical fixing of the panels to the metallic structure, using clamps and screws or equivalent, and the electrical connections of the panels.

After the panels are assembled, the various components of the electrical system will be connected (inverters and equipment installed in the technical building) and the necessary tests and trials will be carried out, followed by the start-up for energy production.

The assembly of the solar photovoltaic panels essentially consists of the mechanical fixing of the panels to the metallic structure, using clamps and screws or equivalent, and the electrical connections of the panels.

After the panels are assembled, the various components of the electrical system will be connected and the necessary tests and trials will be carried out, followed by the start-up for energy production.

The main form of energy to be used in the construction phase will be diesel fuel for vehicles and machinery. In some works, especially in the final phase of the construction, electrical energy will be used.

The domestic wastewater produced in the sanitary facilities by the workers will be directed to a septic tank to be built on the local construction yard. No other effluents are expected to be produced at the site, except for the eventual washing of concrete mixers used on site.

Solid domestic waste will be produced mainly by workers on site, materials from excavations and waste associated with construction work and equipment installation, including packaging waste. It is not expected that the construction yard will have an area for maintenance of equipment and vehicles. Thus, it is

not expected the generation of relevant quantities of lubricating or hydraulic oils and other waste typically generated in this type of activity. The different types of waste generated at the site will be separated and conditioned in specific containers, and removed to an adequate final destination, according to their characteristics.

The operation of vehicles and various machinery in the area of the photovoltaic plant will lead to the resuspension of dust, in addition to the emission of combustion gases typically resulting from the operation of vehicle engines and machinery.

Noise emissions are to be expected because of vehicle traffic to transport equipment, materials and people, and the use of various machinery to be used in the construction work. It is expected that most of the work will take place during daylight hours.

It is foreseen that the construction of the photovoltaic plant will take about 6 months and that in the most labor-intensive phase (a period of about 3 months, when the support structures will be installed and the panels assembled), there may be about 50 to 60 jobs.

Most of these temporary jobs can be filled by local and relatively unskilled personnel. It is anticipated that the site management and higher-skilled jobs may employ about 8 people, some of whom may be foreigners.

The main aspects associated with the operation of the solar PV plant can be summarized as follows:

The operation of the plant is automatically controlled, only requiring intervention in case of breakdown or for external reasons associated with the operation of the grid.

The maintenance of the solar photovoltaic plant is fundamentally preventive and includes cleaning the panels and checking the status of certain components and parameters that may indicate a tendency for faulty operation.

Given the specific conditions of Cabo Verde, in general, and Brava in particular (including the occurrence of high natural concentrations of dust in the atmosphere and proximity to the sea), it is to be expected that, as in other photovoltaic plants in the country, an almost permanent cleaning of panels is necessary, so as not to impair their performance. For the cleaning of the panels there are several applicable solutions, including dry or water cleaning, mechanical or manual cleaning. The recommended solution to be adopted in this plant will be manual cleaning with the minimization of water consumption.

The wastewater will be the effluent from the sanitation facilities, which is expected to be very limited given the small number of workers who will be permanently on the site. It is assumed that the septic tank that was installed in the construction phase will remain active and will receive the wastewater in the operation phase.

Waste generation in the operation phase will be very limited and restricted to waste from equipment maintenance, and may include packaging, batteries, broken or damaged panels, and broken electrical or electronic components. The waste, including any components that may have been replaced, will be handed over by the team in charge of the maintenance to authorized waste management operators.

No relevant noise or air pollutant emissions are expected from the operation of the photovoltaic solar plant. It will, however, contribute to the reduction of

emissions of air pollutants resulting from the production of electricity from fossil fuels.

No heat and light emissions are expected because of the operation of the solar PV plant.

It is anticipated that up to 6 permanent jobs could be created during the operation of the PV plant, which will be supplied locally for cleaning and general maintenance. In addition to these jobs, there will be sporadic use of specialized personnel, not necessarily foreigners, for occasional repair or maintenance activities.

In what concerns the decommissioning phase:

Given that no significant topographical changes were required to install the plant, it will be relatively easy to decommission.

Most of the structures and equipment are relatively easy to dismantle and transport.

The technical building may be demolished (if it is no longer possible to assign it a useful use).

Many of the materials resulting from the decommissioning of the plant have significant potential for recovery (the photovoltaic panels themselves, the metal structures, and electrical cables).

As complementary works to the solar PV plant and its connection to the island's electrical grid, it is also planned to install a Battery Energy Storage System, to mitigate fluctuations in demand and supply of electricity and to facilitate the injection of the electricity into the grid. This storage system will be supplied and installed under a separate contract and will have a specific Environmental and Social Management Plan. In any case, it should be noted that the equipment for the storage system will be packaged in one container which will be received in Cabo Verde ready to be installed. In Brava, the BESS will be located at Electra's thermal power plant, in Favatal, and will have a capacity of 1.1 MW / 6.6 MWh.

In terms of time schedule, it is estimated that a period of eight (8) months may elapse between the start of construction (installation of the construction yard) and the commissioning of the solar PV plant.

The installation of the plant will be done in the scope of an “Engineering, Procurement and Construction” (EPC) contract, which will also cover the operation and maintenance of the plant for an initial period of 2 years, after which operation and maintenance will be provided on a definitive basis by another entity following a tender to be launched specifically for this purpose.

As for the useful life of the facilities, a time horizon of about 20 years can be considered, under normal operation and maintenance conditions.

### **Policy and regulatory framework**

The assessment was carried out taking into account the applicable national legislation, covering, among other aspects:

Environmental impact assessment regulations.

Biodiversity conservation and protection.

Waste.

Water and sanitation.

Air quality, noise pollution.

Cultural heritage.

Territorial and urban planning.

Gender-based violence.

Expropriation.

Health and safety at work.

Labor and working conditions.

Road code.

Private security activities.

Additionally, and given the funding source for the Project, the World Bank's Environmental and Social Framework and the relevant Environmental, Health and Safety Guidelines (EHSs), namely the General EHSs and the Electric Power Transmission and Distribution EHSs have also been considered. The ESF contains an import set of requirements, structured in Environmental and Social Standards, covering aspects like:

Assessment and Management of Environmental and Social Risks and Impacts.

Labor and Labor Conditions.

Resource Efficiency, Pollution Prevention and Management.

Community Health and Safety.

Land Acquisition, Land Use Restrictions, and Involuntary Resettlement.

Biodiversity Conservation and Sustainable Management of Living Natural Resources.

Cultural Heritage.

Stakeholder Engagement and Information Dissemination.

### **Environmental and Social Baseline**

The environmental and social assessment of the plant was performed taking into account the applicable relevant national legislation and the World Bank's Environmental and Social Framework, given the source of funding for the Project.

The assessment involved an environmental and social characterization of the proposed photovoltaic site and its surrounding area, which allowed the following aspects to be highlighted:

The project site is located on a gently sloping site with East/Southeast exposure. The site elevations range from around 230m near the Favatal Thermal Power Station to around 200m in the easternmost areas of the ZDER.

Brava Island has a warm and regular climate (monthly temperatures generally range between 16 °and 25 °C). The dominant winds throughout the year are the trade winds, which blow from the NE. Rainfall on Brava is an average rainfall above 600 mm in humid areas, between 400 to 600mm in sub-humid zones, around 300 to 400 in semi-ari zones and less than 300mm in arid zones. . Brava Island receives strong solar radiation, giving it a very high solar energy potential.

The geological and lithological formations of the site are of an eruptive nature, directly related to volcanic activity. No signs of exploitation of aggregates have been identified on the site. Geomorphologically, the ZDER area corresponds to a plateau with a gentle slope towards the south-east.

There is no known groundwater abstraction point in the area of the ZDER implementation. In the implementation area of the ZDER there is no presence of surface water. The local geology and the strong slopes do not allow the accumulation of rainwater that runs or infiltrates directly into the ground. To the east of the ZDER is the Ribeira Achada do Lajedo, which flows into the Baía da Pedrinha, about 700m Northeast of the ZDER.

The soils at the in the ZDER include Phhacozemes háplicos (Phh), Andossolos háplicos (ANh) e Andossolos vítricos (ANz), depending on the topography. These are poor soils that present severe limitations related to the dryness of the environment. The current uses of the land in the ZDER are, in general, forestation with prosopis and occasional grazing.

The main sources of degradation of the environmental quality in the study area are essentially the Favatal thermal power station and the municipal waste dump. The dump is not fenced and, partially occupies land within the ZDER.

The ZDER does not interfere with protected areas. The Reserva Integral dos Ilhéus Secos or Rombo (which is part of the National Network of Protected Areas; these islets are also classified as an Important Bird Area - IBA CV 009 - by BirdLife International) is about 8 km to the north.. No threatened species were identified at the project site. The ZDER is mostly covered with *Prosopis juliflora* (American wattle, exotic and invasive) and the fauna occurring in the area of the ZDER is also poor.

With regard to susceptibility to forest fire, the ZDER intersects all susceptibility classes considered, from very low to very high but with a preponderance of areas with greater susceptibility, which is related, on the one hand, to the general aridity of the area and the density of Prosopis.

The landscape of the area where the project site in inserted has a limited scenic value and sensibility. The terrain of the ZDER is relatively little visually exposed. The land on which the solar PV plant is planned to be built is owned by the State.

In the project site there is no human settlement, nor is there any known economic activity.

The project site does not interfere with any land planning or management instruments.

There are no known elements of tangible or intangible cultural heritage related to the project site.

## **Risks and Impacts and associated Mitigation Measures**

An assessment of risks and impacts was carried out for constructing, operating, and decommissioning the photovoltaic plant. The results of this assessment can be summarized as follow:

Climate: no climatic or microclimate impacts are expected in the vicinity of the photovoltaic plant. Its operation will have a positive impact by preventing emissions of gases from the burning of fuel to produce electricity, which cause air pollution and contribute to the global warming.

No geological or geotechnical impacts are expected associated with the implementation of the plant.

No significant effects are expected in terms of land use. As in any construction works, there is the potential for soil contamination to occur and this justifies the adoption of mitigation measures.

No water resources are expected to be affected by the implementation of the plant. In any case and as indicated for the soils, mitigation measures are justified to prevent water contamination events.

The construction works may cause a localized increase of dust, but it is not expected that this affects residential areas. In any case, mitigation measures are justified.

Similarly, no noise impact is expected on any residential areas.

The local landscape will be affected by the construction and presence of the photovoltaic plant. This negative impact will not be reasonably possible to mitigate.

It is not expected that the artificialization of the area of the photovoltaic plant will correspond to a significant negative impact in terms of biodiversity. The production of electricity using the solar power corresponds to a positive impact in terms of use of a natural resource.

Different types of waste will be generated. Mitigation measures will be required.

No impacts are expected in terms of cultural heritage. In any case a procedure to deal with the discovery of previously unknown archaeological resources during the project must be implemented.

No interference has been identified with territory planning instruments.

The land where the solar PV plant is to be installed is State owned and does not currently support any built occupation or economic activity. No impacts in terms of physical or economic displacement are expected.

The construction work will create a relevant number of temporary jobs. Specific measures must be adopted to promote the recruitment of local labor and also the recruitment of women. A small number of non-temporary jobs will be generated for the operation phase, which can be filled locally. There is the risk of child and forced labor being used to produce the solar panels (abroad), justifying the adoption of specific preventive measures determined by the World Bank.

There will be health and safety risks for the personnel involved in the construction and operation of the photovoltaic plant, justifying the need for specific health and safety plans which will detail the preventive measures and the emergency procedures to be adopted.

No significant health and safety risks are expected for the local communities during the construction or operation of the photovoltaic plant. However, preventive measures are justified in relation with the traffic associated with the construction works and with the access of unauthorized personnel to risk areas. Also, specific measures will be required for the prevention of Covid-19 and for the security of the facilities.

No significant fire risks are anticipated in relation with the project.

Considering the limited labor influx to and the current situation in terms of Gender Based Violence awareness and prevention in Cabo Verde, no significant risks are expected in this regard. In any case, preventive measures will be

implemented, including strict codes of conduct (as detailed in section 6.5.2 of the ESIA).

No significant risks and impacts are expected in relation with the future decommissioning of the plant. In any case, it will be necessary to manage the materials and equipment which will be removed from the site, promoting its reuse, or recycling as much as possible. Measures will also be justifiable to facilitate the reintegration in the labor market of the personnel which will be demobilized from the photovoltaic plant.

As a general conclusion of this assessment no environmental or social risks or impacts affecting the sustainability of the solar PV plant were identified.

No loss of natural resources has been identified in relation with the plant.

The risks and negative **impacts** are not significant, and the development of the project is even expected to have some positive impacts, in particular in terms of reducing the dependence on fossil fuels for electricity generation on Brava Island, reducing greenhouse gas emissions and improving air quality.

In any case, the implementation of several measures is recommended, with the primary objective of preventing the possible negative risks and impacts and to assure the sustainability of the Project.

These measures can be summarized as follows:

**Measures for the Preparatory Phase:**

Risks and Impacts on:	Measures related to:
<b>General</b>	Grievance Redress Mechanism
	Codes of Conduct (prevention of Gender Based Violence and of Violence Against Children)
	Community Engagement
	Prevention of forced Labor
	Articulation with other Entities
	Detailed Terrain Modelling
	Completion and Detailing of the Environmental and Social Management Plan
	Completion and Detailing of the Health and Safety Plan
	Labor Management

Measures for the Construction Phase

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>
<b>General</b>	Staff Training and Awareness
<b>Geology, Geotechnics and Geomorphology</b>	Execution of Works Use of borrow pits
<b>Soils and Land Use</b>	Construction yard location and operation Waste and wastewater Management Storage and Handling of Hazardous Substances Machinery Overhauls and Maintenance Execution of Works Management of Materials resulting from Excavations Washing of Concrete Mixers and Concrete Residues
<b>Water Resources</b>	Construction yard location and operation Water supply for the work Waste and wastewater management Storage and handling of hazardous substances Machinery overhauls and maintenance Washing of concrete mixers and concrete residues
<b>Air Quality &amp; Noise</b>	Execution of works Preservation of Air Quality and Noise Implementation of the Health and Safety Plan
<b>Waste</b>	Construction yard location and operation Waste and wastewater Management Execution of works Management of Materials resulting from Excavations Washing of Concrete Mixers and Concrete Residues
<b>Cultural heritage</b>	Execution of works Discovery of archaeological remains

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>
<b>Employment and Working Conditions</b>	<p>Staff Training and Awareness</p> <p>Implementation of the grievance redress mechanism (maintaining its accessibility and dissemination to workers)</p> <p>Codes of Conduct (maintenance)</p>
<b>Occupational health and safety</b>	Implementation of the Health and Safety Plan
<b>Community health and safety</b>	<p>Execution of Works</p> <p>Fencing and Signaling of Works and Conditioning of Pedestrian and Car Circulation</p> <p>Fire Prevention</p> <p>Emergency Plan</p>
<b>Human rights</b>	<p>Staff Training and Awareness</p> <p>Implementation of the grievance redress mechanism (maintaining its accessibility and dissemination to communities)</p> <p>Codes of Conduct (maintenance)</p>

Measures for the Completion of the Construction Phase

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>
<b>General</b>	Remediation of Intervened Areas

Measures for the Operation Phase

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>
<b>General</b>	<p>Labor Recruitment</p> <p>Codes of Conduct</p> <p>Update of the ESMP and Health and Safety Plan</p> <p>Staff Training and Awareness</p>
<b>Soils and Land Use</b>	<p>Waste and wastewater Management</p> <p>Storage and Handling of Hazardous Substances</p>
<b>Water Resources</b>	<p>Efficient Use of Water</p> <p>Waste and Wastewater Management</p> <p>Storage and Handling of Hazardous Substances</p>
<b>Risks and Impacts on:</b>	<b>Measures related to:</b>

<b>Waste</b>	Waste and wastewater Management
<b>Employment and Working Conditions</b>	Staff Training and Awareness Implementation of the grievance redress mechanism (maintaining its accessibility and dissemination to workers) Codes of Conduct (maintenance)
<b>Occupational health and safety</b>	Implementation of the Health and safety Plan Emergency Plan
<b>Community health and safety</b>	Facility Security Fire Prevention Emergency Plan
<b>Human rights</b>	Staff Training and Awareness Implementation of the grievance redress mechanism (maintaining its accessibility and dissemination to communities) Codes of Conduct (maintenance)

Measures for the Deactivation Phase:

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>
<b>General</b>	The measures for the decommissioning phase will be, in essence and with the necessary adaptations, identical to those recommended for the construction phase.
<b>Labor</b>	Training of the personnel involved in the operation of the plant, to facilitate their reintegration into the labor market
<b>Waste</b>	Reuse or recycling of decommissioned materials and equipment

In view of the risks and impacts analyzed, it is not considered justifiable to consider possible alternative locations for this photovoltaic park. Its non-implementation, the so-called zero alternative, would be incompatible with the renewable energy development strategy in Cabo Verde and would prevent its contribution to the Project's objectives.

The implementation of the Brava's photovoltaic plant was assessed to be aligned with the Environmental and Social Standards (ESS) contained in the World Bank Environmental and Social Framework.

## Consultation and Information Disclosure and Grievance Redress Mechanism

It is intended that the public consultation and information disclosure actions throughout the development of the project are aligned with good practice and the requirements of the World Bank.

In the scope of preparation of the PESA of the wind and solar ZDER areas, contacts were made with institutions and local communities, with emphasis on the general meeting held on 12 May 2021 in the main hall of the Municipal Chamber of Brava, with the participation of 21 people (4 women and 17 men), community members and representatives from various institutions (City Council and Municipal Assembly of Brava, Delegations of the Ministries of Education and Agriculture and Environment, Fogo/Brava Regional Development Office, Project for Socio-Economic Opportunities in the Rural Environment - POSER, Red Cross, Nossa Senhora do Monte Primary School, Electra, Água Brava and economic agents).

This session aimed to socialize the ideas of the future Parks (solar and wind), collect data and information related to the elaboration of the environmental and social safeguard instruments.

The following main questions were raised:

General questions	Answers
Where will the ZDERs and the interconnection corridors to the public electricity grids be located. When will the execution of the works begin?	The reserve areas of the development areas of the Furna Solar ZDER, Furna Wind ZDER and the Interconnection Corridors to the Public Power Networks are located in the town of Favatal, Brava Island, as indicated in the maps presented. They are served by national road EN3-BR-01 (Furna/Nova Sintra). The corresponding occupied areas/spaces are as follows:
General questions	Answers
	ZDER Solar de Furna: 6 hectares Windy Ventos de Furna ZDER: 37 hectares Interconnection Corridors to Public Power Networks: (Cable buried along the existing carriageway. Approximate length: 1,659 m).

Will the construction of the Solar and Wind Parks make it impossible to build an airport in the area, as the entire population of the island of Brava desires?	The areas to be used are small and will not prevent the construction of an airport, if the potential / conditions of the Favatal area are confirmed. All the necessary measures must be taken in order not to make the construction of an airport infrastructure unfeasible. All the necessary efforts will also be made to make the renewable energy development projects compatible with other projects that may be developed in order to minimize possible interferences.
Who are the funders?	The basic studies were financed by the LuxembourgLuxDev Cooperation and the implementation project will be financed by the Government of Cape Verde. The parks will be financed through public-private initiatives.
What are the advantages of the Project?	The project will provide a reduction in production costs (use of solar or wind energy), although it may take some time. The use of production through energy will allow the concession holder to reduce tariffs. The tariffs will be set by the Government in accordance with the legislation in force.
Will the whole island benefit?	Since there is a single plant and the public network is interconnected, the project will benefit the entire island.

The following main recommendations were noted:

- Take into account the importance of an airport infrastructure, both for the mobility of people and goods, and for issues related to civil protection, given the high seismicity of the island and the consequent threats of natural disasters;
- Given the climatic and topographic characteristics of the island and the fact that the Favatal area is considered one of the few alternatives (if not the only one) on the island for the construction of an airport infrastructure, all measures should be taken in order not to make its construction unfeasible, should the studies confirm these potentialities;
- Make reserve areas and renewable energy development projects compatible with reserve areas for the development of possible airport infrastructure in order to minimise possible interference;
- Reduce the energy costs of families, given the relevant weight on family income and the quality of life of the population;

UGPE has implemented a Grievance Redress Mechanism for the Project. For that purpose, Local Complaints Management Committees have been created, one in each municipality where the Project is developed, as well as the Central Complaints Management Committee (CCMC), along with the means and procedures necessary for the operation of the Grievance Redress Mechanism.

Any person or group of people associated with the project or affected by their activities can submit a question, complaint, or grievance.

Any person or group of persons involved in the project, partner institutions, NGOs and community-based associations, local councils and any individual or group affected by the project can raise a grievance. Anonymous suggestions and complaints are accepted.

The Grievance Redress Mechanism contains provisions related to the reception and registration of grievances, their treatment, analysis and investigation, verification and subsequent actions and the follow-up, monitoring and reporting of the grievances, as well as the communication strategy to be adopted.

Prior to the start of the work, the UGPE will promote the dissemination of the GRM among the various interested and affected parties, including those working on the project.

A public meeting is planned to be held as soon as the contractor is appointed and before the start of the works, in order to introduce the Contractor, who, in turn, will describe his work plan (activities to be carried out and respective expected start and end dates), to present the Project's environmental and social safeguards, with emphasis on the Gender Based Violence and Violence Against Children prevention measures, and to disseminate the Project's Grievance Redress Mechanism.

The budget of the Project already covers the costs for implementation and operation of the Grievance Redress Mechanism.

### **Environmental Management Plan**

An Environmental and Social Management Plan (ESMP) was prepared with the main objective to provide clear mitigation measures for identified potential social and environmental impacts and to establish. These measures correspond to those summarized in the section above covering Risks and Impacts and Associated Mitigation Measures, applicable to the preparatory, construction, operation, and decommissioning phases.

The ESMP clarifies the responsibilities of the various intervening parties in the implementation of the mitigation measures defined to address the risks and impacts of the project. The intervening parties are:

The UGPE, who will establish from the outset the terms of reference to be followed for the environmental and social management of the Project, taking into account the applicable legal requirements and the requirements of the entity financing the Project, and will ensure that these terms of reference are complied with. The UGPE will oversee obtaining licenses and authorizations for carrying out the Project, formal articulation with the various official entities involved in the process and implements a Grievance Redress Mechanism

(GRM) to receive and process complaints related to the Project. The UGPE will oversee the obtaining of licenses and permits to carry out the project, the formal articulation with the various official bodies involved in the process, and the implementation of the Grievance Redress Mechanism (GRM).

The "Owner's Engineer", who will be responsible for assisting UGPE in the procurement of goods and services, controlling and supervising construction works, supporting the implementation of the training program, and supporting and monitoring the implementation of environmental and social safeguards.

The Contractor for the EPC (Engineering, Procurement and Construction) contract will be responsible for the detailed engineering studies, the supply of materials and equipment necessary for this, carrying out the construction work on the photovoltaic plant, the physical execution of the works, under the supervision of the Owner's Engineer (OE) and will thus be the main agent in the generation of environmental and social impacts during the construction phase. The Contractor will also be responsible for starting up the operation of the photovoltaic plant, as well as its maintenance for a period of 2 years.

The Operator. In an initial period, the operation and maintenance of the photovoltaic Plant will be ensured by the Contractor and, subsequently, by an Operator to be selected through a tender to be launched for this purpose. Thus, the Operator will be responsible for the long-term environmental and social management of the photovoltaic plant.

The ESMP also defines the requirements applicable to the environmental and social monitoring, namely in terms of actions by the different intervening parties and the indicators to be calculated, monitored and reported.

The schedule for the implementation of the ESMP and the requirements applicable to its review are also established.

The following table summarizes the environmental and social management activities to be implemented for the subcomponent 1.1 of the Project (photovoltaic plant and their respective interconnections with the electric grid and the battery storage systems), also indicating the responsible parties and the estimated cost:

Activity	Responsibility	Estimated cost	Comments
Implementation of mitigation measures (Contractor and Operator)	Contractor, Operator		The environmental and social management measures to be implemented by the contractor and the operator will rely exclusively to compliance with the applicable legal requirements or best practices and will have a reduced cost, which should be included in the general budget of the respective contracts. It is not foreseen the need to implement any environmental or social measure that implies investment costs.
Environmental and Social Monitoring and Auditing	UGPE	12,000 USD	Lump sum estimation of the costs associated with E&S monitoring and auditing of the project, including possible audits to be carried out by the external entities (e.g., National Directorate for

			the Environment, Delegations of the Environment and Agriculture Ministry, Municipalities, ICIEG). The operational costs of the Owner's Engineer and UGPE teams are not included in this estimation
Stakeholder Engagement	UGPE	5,000 USD	Lump sum estimation of the costs associated with the stakeholder engagement, including public meetings, disclosure of information documents. The operational costs of the Owner's Engineer and UGPE teams are not included in this estimation
Grievance Mechanism	UGPE, Local and Central Grievances Management Committees	10,000 USD	Lump sum estimation of the costs associated with the GRM, including the Local and Grievances Management Committees. The operational costs of the UGPE team are not included in this estimation.
Capacity Building (as detailed in the Environmental and Social Commitment Plan)	Owner's Engineer, Contractor, Operator, ICIEG	21,500 USD	Lump sum estimation of the costs associated with organizing and delivering the capacity building sessions, including mobilization of participants. The operational costs of the Owner's Engineer and UGPE teams are not included in this estimation
Training of Project Workers (initial training of the Contractor's and Operator's management staff)	Owner's Engineer, Contractor, Operator, ICIEG	10,000 USD	Lump sum estimation of the costs associated with organizing and delivering the training sessions. The operational costs of the Contractor's, Operator's, Owner's Engineer and UGPE teams are not included in this estimation
Total		58,500 USD	

### Controversial issues

No controversial issues have been identified in relation with the Brava solar PV plant.

# 1 Introduction

## 1.1 Presentation

The present report updating the Environmental and Social Assessment (ESIA) of the use of photovoltaic energy in the Renewable Energy Development Zone (ZDER, in Portuguese) of Furna, on the island of Brava, elaborated in the Brava Sustainable Island Project as far as the photovoltaic component is concerned.

This assessment assumes and integrates the Preliminary Environmental and Social Assessment (PESA) of the Furna ZDER, (dated June 2021) and provided by DNICE for consideration by the TA in the preparation of this deliverable.

Therefore, the essential information now presented comes from this ESIA, complemented with detailed aspects concerning, namely, the applicable legal framework and the responsibilities for implementing the Environmental and Social Management Plan (ESMP) that is an integral part of this ESIA, in the development of which the relevant national legislation and the World Bank's Environmental and Social Framework (ESF) were taken into account.

As the detailed specifications of the photovoltaic park are not yet defined, it is intended that the work now presented includes useful elements for decision making on the configuration to adopt and establishes the environmental and social requirements to be included in the Tender Dossier. These requirements are set out in the ESMP referred to above and will be included in the next deliverable (Preparation of Tender Dossier). On the other hand and as discussed in the following section, the ESMP presented herein constitutes the basis (to be complemented by the contractor, depending on the specificities of the project it intends to implement) for the Environmental Management Measures.

This plant will be implemented in the scope of the so-called “Cabo Verde Renewable Energy and Improved Utility Performance Project”. This Project is being developed in line with the country's commitment to increase the production and coverage of electricity from renewable energy resources. For that purpose, the Government of Cabo Verde has obtained support from the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA/World Bank), Canada Clean Energy and Forest Climate (CCEFCF) and the Global Infrastructure Facility (GIF) to implement the Project.

The Component 1 ("Renewable and Efficient Electricity Service") of the Project will fund investments to integrate variable renewable energy sources into the grid and provide sustainable and resilient electricity solutions to public health facility buildings. Within this component, Subcomponent 1.1 ("Integration of small-scale renewable energy") will support the construction of small-scale solar power plants, their connection to the grid, as well as the installation of pilot energy storage facilities. The Brava photovoltaic plant is part of this subcomponent of the Project.

The implementation of the Project will be done by the Unidade de Gestão de Projectos Especiais (Special Projects Management Unit - UGPE).

The Project will also finance similar photovoltaic plants to be implemented in the islands of Fogo, São Nicolau, Santo Antão and Maio and the installation of battery systems for the storage of electricity in the five target islands.

## 1.2 Legal framework

As the main legal instruments for framing environmental policy and, specifically, environmental (and social) impact assessment, applicable to the development of the Project:

- The Environment Policy Framework Law (Law no. 86/IV/93) which establishes the bases of Cape Verde's environmental policy, starting from the principle of prevention, based on the reduction or elimination of the causes, and on the correction of the effects of the actions or activities susceptible of altering the quality of the environment.
- Legislative Decree no. 14/97, of 01 July, whose objectives are to optimise and guarantee the use of natural resources, qualitatively and quantitatively, as a basic presupposition for self-sustained development, and to safeguard the right of citizens to a healthy and ecologically balanced living environment and the duty to defend and preserve it, making it the duty of the State and the Municipalities to promote the improvement of the quality of life, individually and collectively;
- Decree-Law no. 27/2020, of 19 March, establishes the legal regime for environmental impact assessment (EIA) of public or private projects likely to produce effects on the environment, revising the regime that was in force since 2006. In this revised regulation, the requirements applicable to environmental impact studies to the evaluation processes will have more adherence to internationally established good practices and to the typical requirements of international funding institutions.

Another change introduced now has to do with the categorization of projects, leading to different types of projects being subject to more or less demanding assessment processes, ranging from Category A, applicable to more complex projects and requiring a full Environmental Impact Assessment, to Category C, for simpler projects, requiring only the approval of environmental management measures. According to the new regulations, photovoltaic park projects with less than 2 hectares fall into category B, requiring the submission of a simplified environmental impact assessment. Photovoltaic parks with more than 2 hectares fall into category A, requiring a full environmental impact assessment.

However, the provisions of article 10(4) of Decree-Law 54/2018, of 15 October (proceeds with the third amendment to Decree-Law 1/2011, of 3 January, which establishes the provisions relating to the promotion, incentive and access, licensing and operation inherent to the exercise of the activity of independent production and self-production of electricity, based on renewable energy sources) must be taken into account:

*“4. The PESER approval replaces and waives the Environmental Impact Assessment (EIA) process or Environmental Incidences studies during the respective licensing process, when the projects are integrated in Renewable Energy Development Zones (ZDER)”*

The Favatal photovoltaic plant is located inside a ZDER established in the PESER, so in the light of this provision, it could be exempted from the respective EIA process.

However, under the new legal regime for EIA, approved by Decree 27/2020, of 19 March, exemptions from EIA no longer have a legal framework.

The project was assessed by the National Directorate of the Environment, in the Category C projects, applying the simplest and most expeditious process, based on the presentation of Environmental Management Measures. In addition to acceptance of the measures proposed by the applicant or the imposition of other measures, the EIA Authority (the National Directorate of the Environment) also established the monitoring and reporting requirements, punctual or periodic, on the environmental performance of the project and issued the Environmental Authorisation within 20 days from the date of receipt of the report with the environmental management measures.

As diplomas of relevant importance in more specific matters, the following may be referred to:

- Decree-Law No 3/2003 of 24 February 2003, amended by Decree-Law No 44/2006 of 28 August 2006, which establishes the legal regime relating to natural spaces, landscapes, monuments and other spaces that deserve special protection and must be integrated in the National Network of Protected Areas, due to their ecological function, importance for the conservation of biodiversity and interest from a socio-economic, cultural or scientific point of view;
- In the waste sector, it is worth highlighting Decree-Law no. 56/2015 of 17 October, which establishes the general waste regime, applicable to the prevention, production and management of waste and approves the legal regime for the licensing and concession of waste management operations. In addition to this decree there are a number of other relevant diplomas, namely the Decree-Law no. 26/2020, of 19 March, which establishes the legal regime of solid urban waste management services, the Decree-Law no. 65/2018 which approves the National Waste List, the Decree-Law no. 32/2016 which approves the National Strategic Plan for Waste Management and the Ordinance no. 18/2016 which establishes the guide model for monitoring the transport of waste by road.

- In the water and sanitation sector, Legislative Decree no. 3/2005, of 19 October, which approves the Water and Sanitation Code - B.O 29/07/2015, Decree-Law No. 8/2004 which regulates the criteria and standards for water quality and its classification and Decree-Law No. 7/2004 which regulates the discharge of wastewater and Regulatory Decree No. 4/2020, of 4 March, which establishes the criteria and parameters intended to control the quality of water for irrigation, of surface or underground origin, desalinated water, recovered rainwater or treated wastewater;
- In terms of air quality, Decree-Law No. 5/2003 of 31 March, which defines the national air protection and control system;
- Law nº 34/VIII/13 of 24 July, which establishes the prevention and control of noise pollution, aiming to safeguard people's rest, peace and well-being.
- Law nº 85/IX/2020 of 20 April, which establishes the Legal Regime of Protection and Values of the Cultural Heritage;
- Legislative Decree No. 4/2018, of 6 July, which approves the Bases of Territorial Planning and Urban Planning and Legislative Decree No. 61/2018, of 10 December, which establishes the National Regulations for Territorial Planning and Urban Planning;
- Law No. 84/VII/2011 of 10 January 2011 - Establishes measures to prevent and repress the crime of gender-based violence (GBV Law);
- Decree-Law No. 2/2007, of 19 July - Soil Law;
- Legislative Decree no. 3/2007, of 19 of July - Expropriation of real estate due to public utility reasons;
- Decree-Law No 55/99, September 6 - Establishes rules on safety, hygiene and health at work;
- Decree-Law no. 64/2010, 27th December - Establishes the general rules for planning, organisation and coordination to promote safety, hygiene and health at work on construction sites;
- Legislative Decree no. 1/2016, of 3 February - Cape Verdean Labour Code.
- Legislative Decree nr. 4/2005 (amended by Legislative Decree nr. 1/2007, of May 11th - Capeverdean Labour Code - approves the Road Code;
- Law 8/V/96, of 11 November, amended by Law 59/VII/2010, of 19 April - prohibits the driving of vehicles by individuals under the influence of alcohol;
- Law nº 50/VII/2009, of 30th December defines the legal regime for the exercise of private security activity.

- Given the proximity to a possible future airport infrastructure, Regulation No. 04/AED/2017 of 11 August, which updates the aeronautical servitude in the areas adjoining that infrastructure.

A comparison between the national legal framework and the requirements of the World Bank's ESF is presented in the Annex. As a synthesis of this comparison, the following aspects can be highlighted, structured according to the Environmental and Social Standards (ES) integrated in the ESF:

- ESS 1 - Assessment and Management of Environmental and Social Risks and Impacts: No significant gaps or conflicts are identified between the requirements of ESS1 and those of national EIA legislation.
- ESS 2 - Manpower and Labour Conditions: No significant gaps or conflicts are identified between the requirements of ESS2 and those of national legislation on manpower and labour conditions. At most, it should be noted that national legislation does not have as explicit requirements as ESS2 on labour management procedures or the adoption of a formal project-specific code of conduct, aspects that should thus be addressed in accordance with ESS2.
- ESS 3 - Resource Efficiency, Pollution Prevention and Management: The legal framework is relatively complete but lacks specific regulations in many areas; national practice in emission control and environmental quality monitoring is relatively incipient. This justifies the use of good practices and international guidelines to complement the existing gaps in the country.
- ESS 4 - Community Health and Safety: No significant gaps or conflicts are identified between the requirements of ESS4 and those of national legislation, which, however, does not have requirements as explicit as ESS4, which should therefore be taken into account. Specifically with regard to proven security services, the requirements in national legislation are considerably aligned with the requirements set out in ESS 4.

- ESS 5 - Land acquisition, restrictions on land use and involuntary resettlement: National legislation presents significant gaps in relation to the requirements of ESS5. Thus, while there is convergence on aspects such as the types of payment, in-kind compensation, consideration of regular occupants and the determination of the eligibility date, in several other aspects there are gaps or even divergence between national legislation and ESS 5, namely with regard to persons eligible for compensation the fact that squatters are not covered, relocation assistance, compensation alternatives, the failure to take into account economic displacement, the absence of specific provisions to protect vulnerable groups, adequate dissemination of information, relevant consultation and informed participation, or monitoring and evaluation procedures. In other terms, the sole consideration of national legislation does not allow safeguarding an important set of ESS5 requirements, thus the use of the instruments and the observation of the requirements foreseen in this ESS should be envisaged.
- ESS 6 - Conservation of Biodiversity and Sustainable Management of Living Natural Resources: The requirements of ESS6 should be applied complementarily to what follows from national legislation (very focused on protected areas).
- ESS 8 - Cultural Heritage: Recent national legislation is reasonably aligned with the requirements of ESS8, with no significant gaps or conflicts identified.
- ESS 10 - Stakeholder Engagement and Information Disclosure: Despite the improvements introduced with the new RJAIA, the options adopted in terms of stakeholder engagement and information disclosure do not fully address the requirements of ESS 6.

### 1.3 Institutional framework

The **National Directorate of Industry, Trade and Energy (DNICE)** is the public entity responsible for all technical aspects related to the Project and for ensuring that it is aligned with the national objectives and policies of the energy sector in Cape Verde. DNICE is also, in formal terms and within the scope of the Legal Framework for Environmental Impact Assessment (RJAIA), the licensing or competent body to authorise the Project at sectoral (energy) level.

The Project will be implemented by the **Special Projects Management Unit (UGPE)** of the Ministry of Finance, which is responsible for the fiduciary management of the project. UGPE establishes the terms of reference to be observed in terms of environmental and social management of the Project, considering the applicable legal requirements and the requirements of the financing institutions and will ensure that these terms of reference are met.

The UGPE will also be responsible for the formal articulation with the various official entities involved in the process and for obtaining the necessary licenses and authorizations for the implementation of the Project's different interventions.

The solar PV plant object of the present assessment will be implemented following a tender to be launched for an EPC (Engineering, Procurement and Construction) contract. Thus, the detailed engineering design of the plant will already be prepared by the EPC contractor. The contractor will be responsible for the operation and maintenance of the PV plant for an initial period of two years. After this period, these activities will be carried out by an entity, in principle national, to be selected through a tender process to be launched for that purpose.

**MRV Energy will act as the "Owner's Engineer"** to support DNICE and UGPE in the Implementation, Control and Supervision of the works and supplies included in sub-component 1.1 of the Project. MRV's intervention thus includes supporting the development and implementation of environmental, social and health and safety management tools, support in the contracting of goods, works and services, control and supervision of the construction works, and support to the UGPE in training activities.

As entities not directly involved in the Project but with a decisive role in the fulfilment of environmental and social safeguards, the following should be highlighted:

- The National Environment Directorate (DNA) of the Ministry of Agriculture and Environment is, under the RJAIA, the Environmental Impact Assessment Authority (EIAA).

As such, DNA will be responsible, among other actions, for coordinating and administratively managing the Environmental Impact Assessment (EIA) procedure of the photovoltaic park, approving the environmental management measures, preparing the Project's Environmental Permit and conducting the environmental post-assessment activities, including the analysis of the monitoring reports and the performance of inspections and audits.

- The Brava Municipality, besides being an essential *stakeholder*, also has competencies in the inspection of the fulfilment of the conditions established within the EIA process.
- The same powers (Environmental Impact Assessment and conducting the environmental post-assessment activities) are also held by the Delegation of the Ministry of Agriculture and Environment in Brava Island.

- The General Labour Inspectorate is responsible for supervising and ensuring the application of legal, conventional, regulatory and contractual provisions regarding employment, working conditions and the protection of workers in the performance of their duties, as well as the compliance with rules on occupational safety, hygiene and health.

## 2 Project Description

### 2.1 General

The Project "Renewable Energy and Improvement of Energy Efficiency in Public Utilities" has as one of its main objectives to increase renewable energy generation.

The objective of increasing electricity generation from renewable energy sources in Brava has direct correspondence with the overall objectives defined in the Sectoral Strategic Plan for Renewable Energy (PESER) and in the Master Plan for the Electricity Sector (PDSE 2018-2040), regarding the increase of the weight of renewable energy and, specifically, photovoltaic and wind energy in the electricity generation *mix in* Cape Verde. These goals are articulated with the scenarios envisaged in the Third National Communication of Cape Verde for Climate Change (MAA / INMG, 2017) and the Nationally Determined Contribution presented by Cape Verde at the Paris Conference in December 2015, as well as in its update presented in 2020.

In practical terms, and according to the elements contained in the Third Cape Verde National Communication on Climate Change, the production of electricity from photovoltaic parks allows a saving of 0.22 tons of fossil fuels (diesel or fuel oil) per MWh of energy generated (i.e. per MWh not produced by burning fossil energies): in other terms, a reduction of 0.7 tons of CO<sup>2</sup> emissions can also be estimated per MWh of energy produced by renewable source (i.e. per MWh not produced by burning fossil energies).

The Project is expected to bring environmental and social benefits, including the reduction of CO emissions and other atmospheric pollutants through the integration of more "clean" electricity, obtained from renewable sources, and a desirable reduction of electricity prices, benefiting the population and the economy of Cape Verde in general, and lower income groups in particular.

### 2.2 Project Overview

The Project is financed by several international entities, namely the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA/World Bank), Canada Clean Energy and Forest Climate (CCEFCE) and the Global Infrastructure Facility (GIF) and has as main objectives to:

Increase renewable energy production; and

Improve the performance of the public electricity service in Cabo Verde, leveraging private financing.

To meet these objectives the Project integrates the following three components:

Component 1 ("Renewable and Efficient Electricity Service") will fund investments to integrate variable renewable energy sources into the grid and provide sustainable and resilient electricity solutions to public health facility buildings.

Component 2 ("Technical Assistance Services for the Restructuring and Privatization of the Electricity Sector", will cover technical assistance for the restructuring and privatization of the electricity sector (ELECTRA) and technical assistance to the Multisectoral Economic Regulation Agency.

Component 3 ("Project Implementation Support and Technical Assistance") will support the Special Projects Management Unit (UGPE) in the management and coordination of the Project and provide technical assistance to the Ministry of Industry, Trade and Energy, more specifically to the National Directorate of Industry, Trade and Energy (DNICE).

Component 1 of the Project includes two subcomponents:

Subcomponent 1.1 ("Integration of small-scale renewable energy") will support the construction of small-scale solar power plants, their connection to the grid, as well as the installation of pilot energy storage facilities.

Subcomponent 1.2 ("Resilient and Efficient Electricity Service in Public Services") will finance public investments in solar photovoltaic systems (on rooftops) and energy efficiency in public health buildings, including public hospitals and health centres.

Based on the priority needs of the Government of Cabo Verde (GovCV), under sub-component 1.1 the Project will support the implementation of four interventions considered in the first phase of the Electricity Sector Master Plan:

Solar PV power plant with a capacity of 1.2 MWp (megawatts peak) in Santo Antão.

Solar PV power plant with a capacity of 0.4 MWp in Maio; and

Solar PV power plant with a capacity of 1.3 MWp in Fogo.

Solar PV power plant with a capacity of 0.4 MWp in São Nicolau.

Solar PV power plant with a capacity of 1.3 MWp in Brava.

Each of these interventions is subject to its own ESIA.

The project will also include the connection of these plants to the grid and pilot battery storage facilities installed which will allow to reduce demand and supply fluctuations, thus supporting voltage and frequency regulation and integration of the electricity generated from the PV plants into the grid.

## 2.3 Project Development Objectives and Benefits

According to the Project Appraisal Document, The Project Development Objectives (PDOs) are to

- (i) increase renewable energy generation; and

- (ii) improve the performance of the electricity utility in Cabo Verde by leveraging private finance.

Yet according to the Project Appraisal Document, the Project will increase Cabo Verde's renewable energy generation capacity, reduce CO<sub>2</sub> emissions, and reduce the power system losses to ultimately provide sustainable electricity services to the population of Cabo Verde and meet the GovCV's power sector reform and renewable energy targets.

It will also improve the efficiency and resilience of public health buildings, as well as support interventions to reduce the skills development and employment gender gap in the energy sector in Cabo Verde.

Finally, the proposed project will support the GoCV in achieving these targets by helping mobilize private and public capital for energy sector investments; increasing stakeholder capacity; and supporting the restructuring and privatization of ELECTRA, which is expected to result in improved efficiency and therefore reduced system losses.

## **2.4 Location of the Furna ZDER**

The ZDER Solar de Furna was delimited within the framework of PESER and has a total area of approximately 58 100 m<sup>2</sup> (5.8 hectares). It is located in the Northeast area of the island of Brava, approximately 3 km from the village of Furna, and is served by an access road, with cobblestone pavement which connects to national road EN3-BR-01, Nova Sintra / Furna (figure 2.1).

This figure also shows the planned route for the interconnection between the ZDER and the public grid for the distribution of electricity produced.

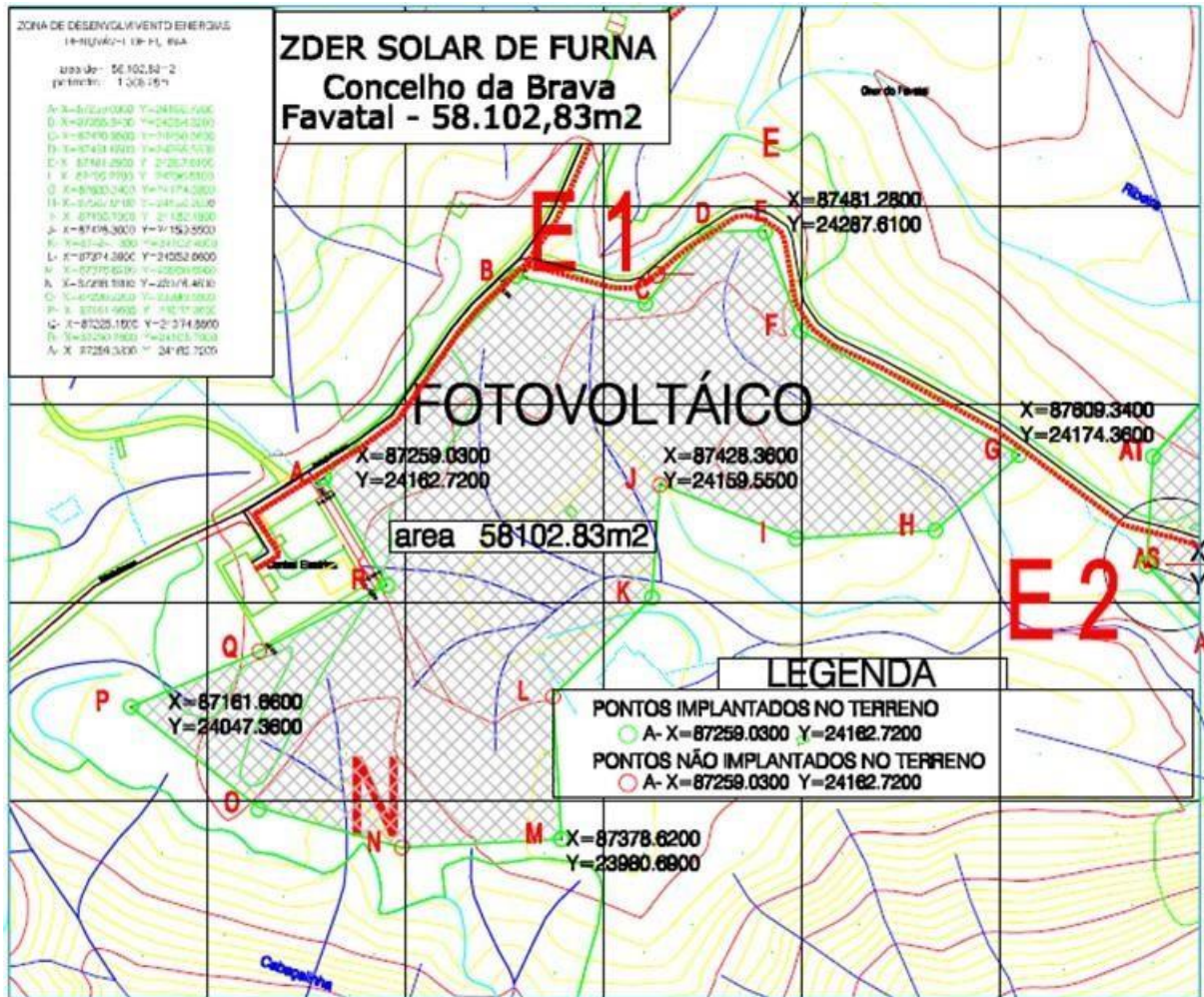


Figure 2- 1- Location of the Furna ZDER

## 2.5 Typical set-up of a photovoltaic park

### 2.5.1 The technology

The photovoltaic effect is obtained by shining light on a photovoltaic cell, which is made up of sheets of semiconductor materials such as silicon. When light is incident on a photovoltaic cell, the photons that constitute light collide with the electrons in the structure of the semiconductor material, generating an electric current.

A photovoltaic cell is the basic unit of a photovoltaic system. The most common types of photovoltaic cells on the market are monocrystalline, polycrystalline and amorphous silicon cells.

The yield coefficient corresponds to the proportion of solar energy transformed into electrical energy. Depending on the structure of the solar cells produced on an industrial scale, the yield coefficient is around 7 to 16%, although cells with higher yields already exist.

A photovoltaic cell produces a small electrical power, typically between 1 and 3 Watt (W), with a voltage below 1 Volt (V). To obtain higher powers, cells are integrated into photovoltaic modules (also called panels or collectors).

Photovoltaic modules are therefore made up of a set of cells connected in series and/or parallel. Connecting several cells in series increases the voltage available, while connecting them in parallel increases the electrical current. Typically, the modules on the market consist of 36 cells connected in series for 12 V applications. The larger the module, the greater its power, as well as the voltage and/or current provided.

The solar radiation generates an electric current in the photovoltaic cells, which are grouped into modules. The modules, in turn, are grouped in series and parallel, in different sets, as required, according to the size of the park and the required electrical voltage.

The electrical energy produced by photovoltaic collectors is in direct current, and it is necessary to use inverters to convert it to alternating current and transformers to raise the voltage according to the requirements of the receiving grid.

The operation of the park is automatically controlled, requiring external intervention only in the event of a breakdown or for external reasons associated with the operation of the electricity grid.

The control and protection systems ensure optimum operation of the park and compatibility with the electricity grid, in order to avoid damage to its components and possible disturbance to the stability of the electricity grid.

Through the control and monitoring systems installed in the Switchgear Post building and the communications system, it is possible to remotely control and consult various operating parameters.

## **2.5.2 Installations**

### **2.5.2.1 Photovoltaic solar panels and mounting structures**

The electricity generators consist of solar photovoltaic panels, which will be installed on metallic structures designed to position them to best capture the solar radiation of the site (typically oriented to the south).

The panels are typically grouped in strings connected in series or in parallel, and are subsequently fixed to the metallic structure that rests on the ground, either directly (by means of stakes driven or screwed directly into the ground) or indirectly (by fixing them to concrete blocks).

The panels can be mounted in a fixed manner or fitted with a solar tracking system, also known as a solar tracker, which optimises the orientation of the panels throughout the day according to the position of the sun.

The ground anchorages and structures are dimensioned to ensure the integrity and optimum operation of the panels under the possible wind effects considered for the site, throughout the life of the project. These anchorages and structures are dimensioned according to the

applicable regulations, taking into account in particular the specificities of the project site and the possible constraints and efforts caused, namely, by the wind.

The distance between rows of panels is determined by the morphology of the terrain and should be sufficient to avoid losses in energy production through shading between panels.



*Figure 2- 2- Example of photovoltaic panels and respective support structure; transformer cabins in the background (Sal island)*

According to the information already available at this stage, compliance with the following international standards will be required:

- Photovoltaic modules (panels):
  - IEC 61215, "Crystalline silicium terrestrial photovoltaic (PV) Modules - Design qualification and type approval";
  - IEC 61730 (2nd edition), "Photovoltaic (PV) module safety qualification".
- Structures for assembling photovoltaic modules:
  - Demonstration of the structural resistance of the support structure obeying Eurocode 1 (EN1991) for a fundamental wind load of 100 km/h.

### **2.5.2.2 Inverters, transformer substations and switching stations**

The inverter is an electrical device whose function is to convert direct current from the solar panels into alternating current according to the standards of the electrical network which will receive the electricity produced in the photovoltaic park.

The inverter operation is fully autonomous. When there is sufficient solar radiation and the panels generate enough current to reach the inverter input limits, the unit's regulation and control unit starts supervising the voltage and frequency on the grid side.

Whenever the grid parameters are in line with the grid connection requirements and there is sufficient solar radiation, the inverter starts the process of injecting electrical energy into the

public grid. At dusk, when the available energy is below the minimum limits for injection into the grid, the inverter completely disconnects from the grid and suspends its operation until the following day.

The solar panels will be grouped and connected to inverters (grouping configuration and number of inverters to be defined in the project). Each inverter will be directly connected to a power transformer in a Transformer Station, being installed inside this station.

The inverters convert the electrical energy from Direct Current to Alternating Current at a reduced voltage, which in turn will be converted in the transformer stations to the voltage and frequency required for injection into the grid.

According to the information already available at this stage, the inverters should meet the requirements of the standards:

- IEC 62109:2010, "Safety of power converters for use in photovoltaic power systems";
- IEC 62116:2014, "Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures;
- IEC 61727:2004, "Photovoltaic (PV) systems - Characteristics of the utility

The transformer substations have monoblock medium voltage switchboards, typically with circuit breakers that use SF6 (sulphur hexafluoride) in a closed circuit (no emissions). SF6 is a synthetic gas, used mainly by the electrical industry as an insulating medium and electric arc extinguisher, which protects and isolates the respective transformer substation from the internal medium voltage network, which in turn interconnects with the isolating substation. It is a non-flammable, colourless, odourless gas, much denser than air and non-toxic; however, it has a strong greenhouse effect (hence the importance of using it in a closed circuit, with no emissions).

The transformer substation includes 3 distinct and physically separated zones, one where the power transformer is installed, another where the inverters are located and a third zone where the remaining equipment is installed. Access to the transformer area is only permitted when the protection cell, which interconnects it with the monoblock, is in the open position and with the phases on ground, i.e., when the absence of voltage for accessing this room is ensured through mechanical interlocks.

Transformers generate heat and need to be cooled and this can be done using dry systems (air cooling) or highly refined mineral oils and additives. In the past, the oils used in transformers and capacitors often contained PBCs (poly-chlorinated biphenyls), substances of high environmental toxicity that were banned by the Stockholm Convention on Persistent Organic Pollutants (ratified by Cape Verde in 2006). However, it is good practice that oilcooled transformers are installed in sealed cells with proper drainage systems, thus preventing possible infiltration into the soil in case of leakage or spillage of oil.

The transformer stations (the number of which will be defined in the project) will be installed in cabins (typically prefabricated), set on concrete blocks

The switching station is equipped with a set of medium voltage cells that disconnect and connect the installation to the public distribution network. It is also equipped with protections that ensure the safety of the installation against any defects coming from the grid, as well as preventing internal defects in the installation from propagating to the external electrical network.

The switching station can be installed in a concrete and masonry building of modest dimensions, designed to house the solar photovoltaic park's control and management systems and the medium voltage equipment that will interconnect it with the public electricity grid. This building can also house general support facilities for the operation of the park.

### **2.5.2.3 Command, control, monitoring and metering systems**

The photovoltaic park will have command and control devices, as well as monitoring systems that record the relevant parameters relating to the resource, production and operation of the main bodies.

The function of the electric energy metering equipment to be installed is to measure the electric energy supplied to the receiving grid and the electric energy consumed by the producing installation.

### **2.5.2.4 Protection systems and earthing network**

They essentially consist of copper-covered steel rod electrodes buried vertically so that their tops are at least 80 cm deep. The number of these rods interconnected in the same circuit depends on what is necessary to obtain a resistance value as low as possible, below the regulatory value.

The connections are made by bare copper cable between the electrodes and PVC insulated cable between the electrodes and the installation.

### **2.5.2.5 Accessories**

The buildings are equipped with suitable accessories for live parts, such as: rubber mat or wooden platform for switching, switching gloves, portable light source with independent power supply, table with first aid instructions, map to record the earth resistance values and the triangular plates with the warning "DANGER OF DEATH", fixed in several more visible places.

The auxiliary systems also include ventilation, alarm system and portable fire extinguisher, as well as a set of batteries and rectifier to ensure the permanent operation of some systems, during the night and in case of power cuts.

### **2.5.2.6 Interconnection with the public network**

The electricity produced in the photovoltaic park will be drained in medium voltage (20 kV) through a very short connection, to the Favatal thermal power plant which is adjacent to the ZDER.

It is planned that this connection will be made by buried cable in a dedicated trench to be opened for this purpose.

## 2.6 Configuration of the photovoltaic park in the Furna ZDER

As part of the *Site Appraisal Report*, the Furna Solar ZDER has been subdivided into 3 zones (West, Central and East) in order to facilitate analysis of the available land.

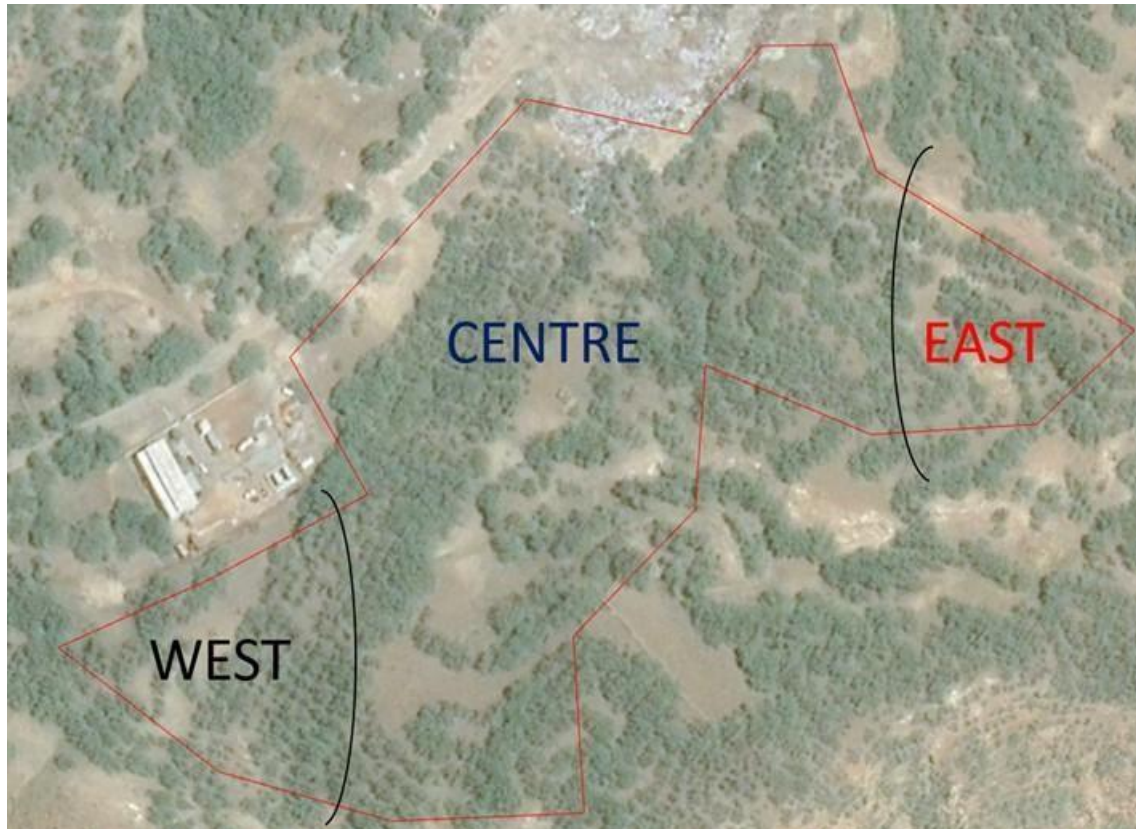


Figure 2- 3- Zoning of the ZDER

The result of this analysis points to the central zone of the ZDER as the one to be preferentially used, as it is more favourable in terms of land slopes, available surface area, energy production (less losses due to shading) and greater ease of assembly of the structures supporting the panels.

The studies carried out as part of the *Site Appraisal Report* indicate a global solar radiation available in the ZDER of 2 000kWh/m<sup>2</sup> per year, with 3% uncertainty.

For the exploitation of this resource, two possible configurations were considered, both with 4 088 panels for an installed capacity of 2 227.96 kWp / 1 856 kWac. One of these configurations uses a system with a solar tracker and a distance of 6m between rows of panels, and the other with a fixed structure and a distance of 8m between rows of panels.

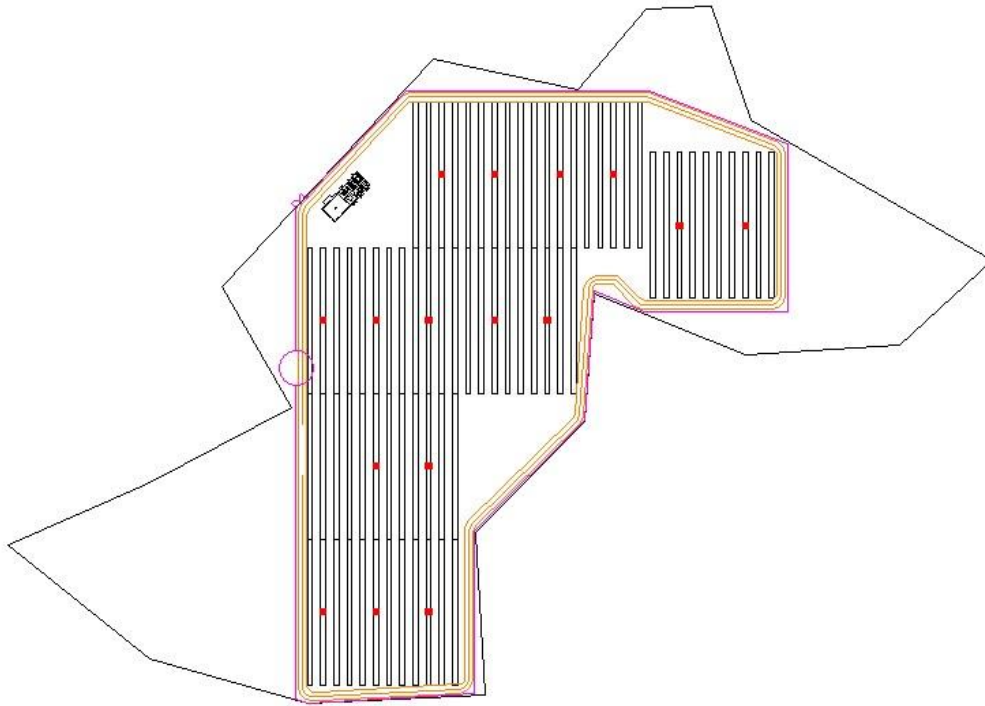


Figure 2-4- Configuration with solar tracking system

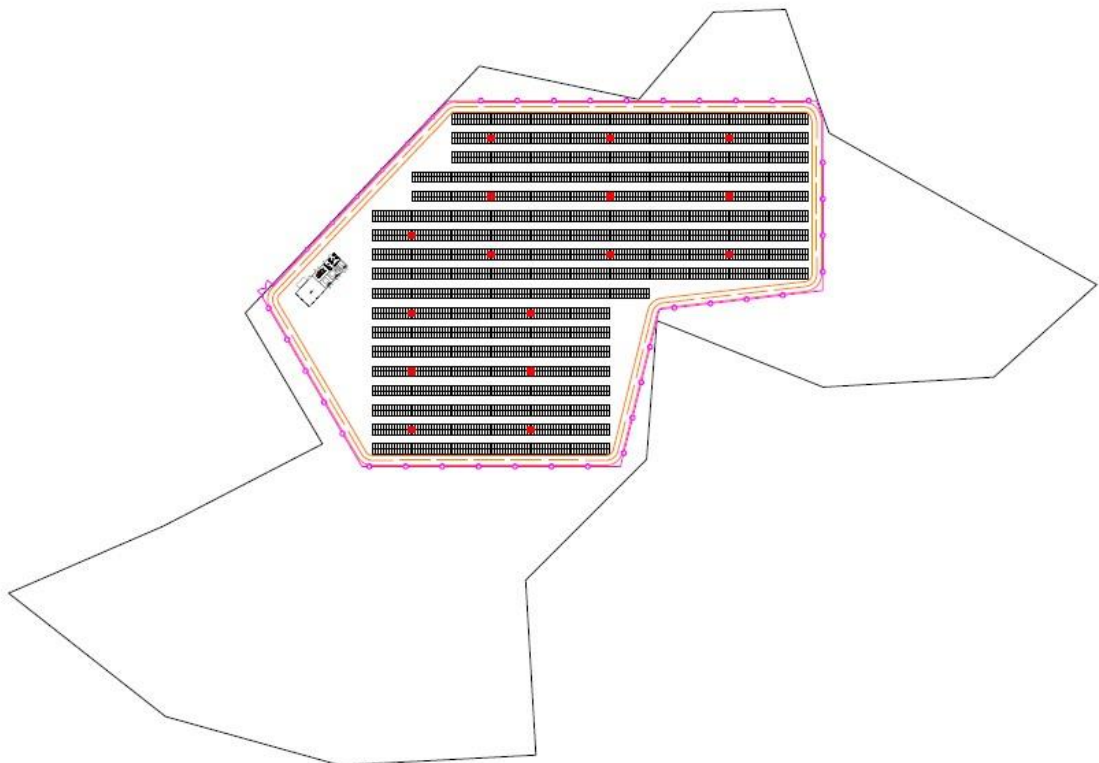


Figure 2-5- Configuration with fixed structure

The Site Assessment Report concludes that the solar tracking system configuration is preferred, forecasting the occupation of a total area of 3.6 ha for the installation of the photovoltaic park.

Within the Site Evaluation Report it was also recommended that in addition to the installation of the photovoltaic plant, due to its proximity to the Favatal Thermal Power Plant, the available area in the ZDER should be used to implement the battery energy storage system (BESS), the connection of the energy systems and the installation of the control room, serving the totality of electricity generation from renewable sources (photovoltaic and wind) in Brava.

## **2.7 Implementation Actions**

### **2.7.1 Construction phase**

#### **2.7.1.1 Construction yard**

To support the work, a small site will be set up with containers, as is usual in similar works, which includes a meeting room, a staff support area, namely sanitary facilities, and a space for storing tools and materials.

As the waste water produced in the sanitary installations on site is exclusively domestic in origin, the sanitary installations will be removable and should be connected to a septic tank (which may / should in the future serve the park's operational support facilities).

#### **2.7.1.2 Civil construction works**

One of the characteristics of this type of project is that the structures for mounting the panels can reasonably adapt to the morphology of the terrain. It is therefore not expected that the creation of the photovoltaic park will involve major earth movements (embankments, excavations). Foreseeable civil construction works include mainly:

- The preparation (cleaning, regularization, construction of septic tank) of the area for the installation of the construction site (assumed to be inside the area for which the park is planned to be built);
- The construction of the concrete blocks for the posts and the laying of the metal mesh for the fence;
- The improvement of the access road and extension of access paths within the site;
- Excavations to dig trenches for laying electricity cables;
- Driving piles into the ground or concreting concrete blocks for the foundations of the metal structures for fixing the collectors;

- The assembly of the metallic structure for fixing the collectors;
- The opening of trenches inside the photovoltaic park and between it and the Favatal power station, for the subsequent laying of electric cables, followed by backfill and closure of these trenches (with the appropriate signposting);
- The installation of electrical equipment;
- The construction of a masonry building for the installation of the switching station.
- The construction of concrete bases for the installation of prefabricated cabins for the transformer stations, where the transformers and inverters will be housed.

Various machinery will be used to carry out the work, including excavators, self-propelled concrete mixers and transport vehicles for equipment and materials.

The purpose of the improvement and extension of the access roads is to enable heavy vehicles and machinery to circulate to the collector sewer installation sites. These paths will not be sealed and, after the work, the verges may be rehabilitated if necessary, with the minimum width required for access by light off-road vehicles for maintenance operations.

As for the excavations, the resulting materials will be stored nearby and preserved for subsequent soil replacement. The trenches will be dug preferably on the edge of the access roads in order to minimize the areas of intervention of the work.

### **2.7.1.3 Mounting of solar collectors and electrical installations**

The assembly of photovoltaic solar collectors essentially consists of the following operations:

- Mechanical fixing of the panels to the metal structure, using clamps and screws or equivalent;
- Electrical connections of the collectors (in series or parallel, depending on the configuration).

The transformer substation cabins are placed on previously prepared foundations and the switchgear is installed inside the respective building.

Once the collectors have been assembled, the various components of the electrical system are connected up and the necessary tests and trials are carried out, followed by commissioning for energy production.

### **2.7.1.4 Materials and energy used**

The main materials to be used in the construction phase will include the following at the outset:

- Photovoltaic cells, assembled in modules (or "panels");
- Metallic structure to support the solar panels;

- Protective glass placed over the panels and fixed to the metal structure;
- For construction work, the main materials to be used are as follows:
  - Concrete for the solid sections of the fence posts, for the masonry building that will house the switching station and for the bases of the prefabricated cabins that will house the transformer stations;
  - Prefabricated cabins (concrete, metal structure or mixed) of the transformer stations;
  - Concrete blocks for the masonry sectioning station building;
  - Piles or concrete and metal structures for fixing the panels;
  - Metallic mesh and metal pipe posts for fencing the park;
  - Tubes in plastic material for passing electric cables;
  - Sand for wrapping the cables in the trenches;
  - Paint for painting the sectioning station and solvents for minor corrections to some equipment, if necessary.
- Copper electrical conductors;
- Aluminium cables, copper earth cables, various electrical wires for auxiliary services in copper and communications cables;
- Transformers, relays and various copper, steel and plastic components, among others. Depending on the type of transformers, oils may be present; SF6 gas may be used in circuit breakers.

The main form of energy to be used in the construction phase will be diesel for the vehicles and machinery (excavators, concrete mixers, etc.). In some works, especially in the final phase of the construction, electrical energy will be used, for lighting inside the building and the prefabricated cabins, and for some electric or pneumatic tools.

### **2.7.1.5 Effluents, waste and emissions**

#### Waste water

The domestic waste water produced in the sanitary facilities by the workers during the construction phase (an unspecified number for the time being, but not expected to exceed two dozen during the most labour-intensive period) will be directed to the septic tank to be built on the local building site.

No other effluents are expected to be produced at the construction site, with the exception of the possible washing of concrete mixers used on site. In this case, the leftover concrete will be sent to a delimited area, which will be subsequently recovered.

## Waste

During the construction phase, solid domestic waste will be produced mainly by the workers on site, materials from the excavations and waste associated with the construction work and installation of equipment, namely packaging waste (metal, plastic and cardboard packaging, wooden pallets and other waste resulting from the conditioning of the photovoltaic collectors).

Although in small quantities, there may still be waste from metal and wooden frames and formwork, as well as from damaged pallets and wooden reels of electric cables that cannot be reused.

The construction site is not expected to have a maintenance area for equipment and vehicles used in the construction work. Thus, it is not expected the generation of relevant quantities of lubricating or hydraulic oils and other waste typically generated in this type of activity.

The waste will be separated and conditioned in specific containers, and removed to an adequate destination, according to its characteristics.

## Noise

Noise emissions are to be expected as a result of vehicle traffic to transport equipment, materials and people, and the use of various machinery to be used in the construction work. It is expected that most of the work will be carried out during daytime hours.

## Atmospheric emissions

As mentioned, the construction of the photovoltaic park is not expected to involve major landfills and excavations. In any case, particulate matter (dust) will always be raised as a result of land clearing and regularisation and the opening and closing of trenches. The traffic of vehicles and various machinery on unpaved roads will also lead to the raising of dust, in addition to the emission of combustion gases typically resulting from the operation of vehicle and machinery engines.

## Light and heat emissions

The construction work is not expected to involve significant light and heat emissions. The fencing of the park and the metal structures for the assembly of the panels are expected to use mostly mechanical connections, with modest use of welding. The fact that the construction work is expected to take place mostly during the day will mean that limited use will be made of artificial lighting.

## Labor

It is foreseen that the construction of the solar PV plant will take about 4 months and that in the most labor-intensive phase (a period of about 2 months, when the support structures will be installed and the panels assembled), there may be about 50 to 80 jobs.

Most of these temporary jobs can be filled by local and relatively unskilled personnel. It is anticipated that the site management and higher-skilled jobs may employ about 15 people, some of whom may be foreigners.

## 2.7.2 Operation phase

### 2.7.2.1 Operation of the Solar PV Plant

The objective of the operation of the solar PV plant is to capture energy from solar radiation and convert it into electrical energy through solar PV cells.

The solar radiation originates an electric current in the solar PV cells, which are grouped into modules. The modules, in turn, are grouped in series and in parallel, in several sets, as needed, according to the size of the plant and the desired electrical voltage.

The electric energy produced by the solar PV panels is in direct current, and it is necessary to use inverters to convert it to alternating current, and transformers to raise the voltage according to the requirements of the receiving grid.

The operation of the plant is automatically controlled, only requiring outside intervention in case of breakdown or for external reasons associated with the operation of the grid.

The control and protection systems ensure the optimized operation of the plant and compatibility with the electrical grid, to avoid damage to its components and possible disturbances to the stability of the electrical grid.

Through the control and monitoring systems installed in the technical building and the communications system, it is possible to remotely control and consult various operating parameters.

### 2.7.2.2 Maintenance

The maintenance of the photovoltaic solar park is fundamentally preventive and includes cleaning the panels and checking the state of certain components and parameters that may indicate a tendency to malfunction.

Given the specific conditions in Cape Verde, in general (namely the occurrence of high natural concentrations of dust suspended in the atmosphere and the proximity to the sea), it is to be expected that, as in other photovoltaic plants in the country, the panels will require almost permanent cleaning so as not to harm their performance.

The reliability of photovoltaic solar collectors is very high, however, minor faults can occur in the park, namely in terms of the electrical and electronic control systems (relays, fuses, microprocessors, batteries, etc.). In these cases, it may be necessary to replace the faulty components.

Major faults, particularly in collectors, inverters and transformers, are rare. However, if they do occur, it will be necessary to repair or, as a last resort, replace the defective components.

Apart from exceptional maintenance operations (replacement of panels, inverters, etc.), routine maintenance is required as indicated in the table below:

Given the specific conditions of Cabo Verde, in general, and the Island of Brava in particular (including the occurrence of high natural concentrations of dust in the atmosphere and

proximity to the sea), it is to be expected that, as in other solar PV plants in the country, an almost permanent cleaning of panels is necessary, so as not to impair their performance.

*Table 2.1 - Maintenance and Monitoring of PV Plants*

<b>Maintenance Activity</b>	<b>Description</b>
<b>Periodic verification of installations</b>	Regular verification of the proper functioning of the site's electrical installations (video surveillance, motors, inverters, transformers, etc.).
<b>Replacement of electrical elements</b>	As needed with age
<b>Maintenance of the mechanical components of the plant</b>	Some of the panels will need to be replaced throughout the life of the plant. In fact, panels may malfunction due to thermal shock, mechanical shock, or a manufacturing anomaly. Security devices, i.e., intrusion detection and fire protection, will be regularly checked and kept in good working order.
<b>Modules cleaning and visual inspection</b>	Cleaning of the PV modules is necessary to ensure maximum energy production from the PV plant
<b>Maintenance of the site's vegetation</b>	No phytosanitary product should be used during the maintenance of vegetation.

For the cleaning of the panels there are several applicable solutions, including dry or water cleaning, mechanical or manual cleaning. The solution to be adopted in the plant under study will be confirmed in the engineering studies to be developed by the Contractor, considering, among other aspects, the specificities of the panels to be installed and the applicable requirements (for example, in terms of guaranteed panel performance). However, the basic recommended solution will be manual cleaning and minimizing water consumption, for the following reasons:

- Job creation, albeit limited in number, during the entire operation period of the PV plant that would be the case with mechanical means.

- Potential reliability problems / maintenance needs of mechanical cleaning systems.

- Higher investment costs and energy consumption for the operation of mechanical cleaning systems,

- The use of cleaning solutions with minimized water consumption (preferably dry cleaning) is justified by the scarcity of water resources in Cabo Verde in general and in the island of Brava, in particular.

### **2.7.2.3 Energy production**

The production of electrical energy in the park will depend on the exact specifications (dimensions, technology / efficiency) of the project implemented there. As previously stated, the available information at this date indicates that the ZDER will implement a photovoltaic project with an installed power of 2 227.96 kWp / 1 856 kWac.

This will be in line with the objectives and targets set nationally to increase the penetration of renewable energies, and photovoltaic energy specifically, and consequently to decrease the import and consumption of fossil fuels and associated emissions.

The energy produced in the park and injected into the electricity grid will be accounted for through energy meters, under conditions to be established under the terms of the applicable legislation.

#### **2.7.2.4 Materials and energy used**

The materials used in the exploitation phase are very scarce and are normally associated with maintenance, including fundamentally:

- Control system batteries (maximum one replacement every 3 years);
- Replacement electrical and electronic components (in case of breakdown);
- Replacement manifolds (in case of breakdown or deterioration).

Cleaning the solar panels will require the consumption of some fresh water. Given the scarcity of water, it will be necessary for the entity in charge of the photovoltaic park to adopt forms of efficient use of water, benefiting from the experience already existing in similar situations, for example, to collect water at the lower part of the PV modules, via drain pipe, and returns it to the water tank, for reuse, such that the water cycle is closed..

The consumption of electrical energy in photovoltaic parks, namely for command and control systems, protection and communications will correspond to a small percentage of the energy produced.

#### **2.7.2.5 Effluents, waste and emissions**

##### Waste water

The only waste water in the operational phase will be sewage from the sanitary facilities, which is expected to be small given the limited number of workers that will be on site at all times (mainly for cleaning and security). It is assumed that the septic tank installed during the construction phase will remain active and will receive waste water during the operational phase.

##### Waste

The production of waste in the operation phase is very low and is restricted to waste from equipment maintenance, which may include packaging, batteries, broken or damaged collectors and broken electrical or electronic components.

If the transformers are oil-cooled, the oil must be replaced at long intervals (several years depending on the specifications of the transformers to be installed).

This waste, including any components that may have been replaced, will be delivered by the team responsible for maintenance to entities authorised to manage it.

##### Noise

The operation of the photovoltaic solar park does not cause any noise emissions that might disturb the neighbourhood.

#### Atmospheric emissions

The operation of the solar photovoltaic park does not originate atmospheric emissions, but contributes to reduce emissions resulting from the production of electricity from fossil fuels. Emissions from vehicles used in maintenance activities will be negligible, since these activities will occur very sporadically and on a very small scale.

#### Light and heat emissions

No heat and light emissions are expected as a result of the operation of the solar photovoltaic park.

However, in this specific case and taking into account the proximity of the ZDER to a possible future airport infrastructure, it should be noted that the reflectivity of sunlight on photovoltaic panels and the potential risks for aeronautical safety is an issue that has deserved international attention, along with the possibility of generating electromagnetic interference by the DC cabling and inverters present in the parks.

However, international literature indicates that photovoltaic panels may reflect only 2% of the incident sunlight, depending on the angle of the sun and assuming they are fitted with anti-reflective coatings (Plante et al., 2010). On the other hand, the application of shielded switchboards, shielded cabling and filters or shielding of inverters are measures which, together with distance from navigation systems, are examples of effective measures to prevent possible electromagnetic interference.

It is assumed that these aspects will be duly taken care of in the development of the detailed engineering studies for the photovoltaic park, with the solutions being subject to authorisation by the aeronautical authority, as required by regulation, if it is confirmed that the project to create an airport infrastructure goes ahead.

### **2.7.3 Decommissioning phase**

Given the characteristics of the components of the photovoltaic park and the fact that its installation has not required significant topographical changes, its decommissioning can be done with relative simplicity.

Most of the structures and equipment are relatively easy to dismantle and transport, with no notable risks of environmental liabilities remaining on the ground.

Particular attention should be paid to transformers, especially if they are oil-cooled, to prevent possible spillage.

The sectioning station building may be demolished (if it is no longer possible to assign it a useful use).

It should be noted that many of the materials resulting from the future decommissioning of a facility of this type have significant recovery potential (the photovoltaic panels themselves, metal structures and electric cables).

## 2.8 Complementary projects

As complementary works to the construction of the photovoltaic park, it should be noted the installation of a medium voltage electricity branch line, to be built by the promoter, between the park and the public network reception point defined by the licensing authority.

## 2.9 Timetable

Indicatively, it is estimated that a period of 6 to 8 months may elapse between the start of construction (installation of the construction site) and the photovoltaic park's entry into testing. The tests should take place immediately after the conclusion of the installation of the photovoltaic park and, if successful, the start of operation will follow.

As for the useful life of the installations, a time horizon of around 20 years can be considered, under normal operating and maintenance conditions.

## 2.10 Identification of alternatives

Under PESER, approved by Resolution No. 7/2012, the location of a ZDER for the use of solar energy on the island of Brava was defined, which corresponds to the area currently under study, and no changes are currently being considered to the delimitation of the ZDER.

The option for harnessing solar energy was also taken under the PESER, which is why no alternatives are being considered regarding the renewable energy source to be exploited. The solar photovoltaic technology is currently relatively mature and there is already experience of similar installations in Cape Verde. The definition of the exact specifications of the technology to be used to maximise the exploitation of the solar energy potential that is intended to be exploited will be made within the scope of the engineering studies for the photovoltaic park.

Thus, the only alternatives to consider at this point are:

- the so-called zero alternative, i.e. not implementing a photovoltaic project at the ZDER location; and
- the alternative configurations for the photovoltaic park within the ZDER (described in section 2.4).

## 3 Environmental and social characterisation

### 3.1 Previous considerations

The environmental and social characterisation presented below is based on what was presented in the PESA of the Furna ZDER, in which a brief biophysical and socio-economic characterisation of the SDA and its surroundings was made through field reconnaissance and consultation of cartography and other published information. A series of stakeholder consultation activities were also carried out within the scope of the PESA.

The following figure briefly illustrates the geographical framework of the ZDER.



Figure 3- 1- Geographical framework of the Furna ZDER

## 3.2 Biophysical environment

### 3.2.1 Topography

The ZDER Solar de Furna is located on a gently sloping site with East/Southeast exposure.

The site elevations range from around 230m near the Favatal Thermal Power Station to around 200m in the easternmost areas of the ZDER.



Figure 3- 2– Extract from the Cape Verde map at 1:25 000 scale (sheet 40, with representation of the ZDER)

The access to the property is via a cobblestone access road that connects with the national road EN3-BR-01, Nova Sintra / Furna.

### 3.2.2 Climate

Considering the average annual rainfall values as an index of climate classification, the island of Brava fits into a characteristically semi-arid ( $200 < P < 500$  mm) / tropical dry climate, but moderated by maritime action, namely in terms of temperature and humidity.

The dominance of the NE trade winds (which occur from October to June) is one of the main causes of this situation, since they do not carry rain-rich air masses, which means that the island suffers from drought almost all year round, a situation that directly affects the population's own water supply.

The tendency towards excessive drought, which characterises this territory, is further reinforced by the Harmattan (Saharan dust), which is felt from October to June, but with greater incidence at the beginning of the year, which, being a very hot and dry wind, causes the humidity of the air to decrease and is often accompanied by suspended particles, lasting from several days to a week.

Only in a short period, from August to October, is there the dominance of the South Atlantic Monsoon, a hot and humid wind that comes from the W and SW and which, being irregular, also leads to uneven and variable precipitation.

In this context, the rain that falls, generally between July and October (but more concentrated in August and September), has on the other hand an unfavourable distribution for the soil, because it usually falls in the form of short and very intense precipitations, which in view of the poor stability of the soil aggregates and the very steep slopes, often causes great damage. It is also verified that infiltration is reduced, and that a large part of the rainwater that runs along the slopes ends up in the sea.

However, and depending on the relief, the distance from the sea and the exposure of the slopes to winds, the island presents very specific micro-climates, with very particular local conditions in areas of higher altitude or slopes more exposed to a given orientation.

On the island of Brava, it can be said that, in general terms, in the high areas, the climate is temperate and in the lower coastal areas, the climate is warmer.

Monthly temperatures generally range between 16 °and 25 °C.

Rainfall is very variable from year to year and, as a rule, precipitation is torrential.

The humid areas, with an average rainfall above 600 mm, are located in the higher parts and on the slopes exposed to the trade winds and in the northern half, at an altitude above 450 m, in a strip that comprises approximately 12% of the island. The sub-humid zones present precipitation between 400 to 600 mm below the 450 m elevation and over the southern half, which covers 24% of the surface of Brava. The semi-arid zones are characterised by average rainfall around 300 to 400 mm on the slopes not exposed to the trade winds and below 300 m. The arid zones are also found below 300 m, with average rainfall of less than 300 mm.

### **3.2.3 Geology and geomorphology**

The geological and lithological formations in the area surrounding the project site are of an eruptive nature, directly linked to the island's volcanic activities.

As part of the TA a geotechnical study of the ZDER was carried out, which confirmed the presence of a typical sequence of topsoils, overlying weathered or unconsolidated pyroclastics (sandy material) and cemented pyroclastics.

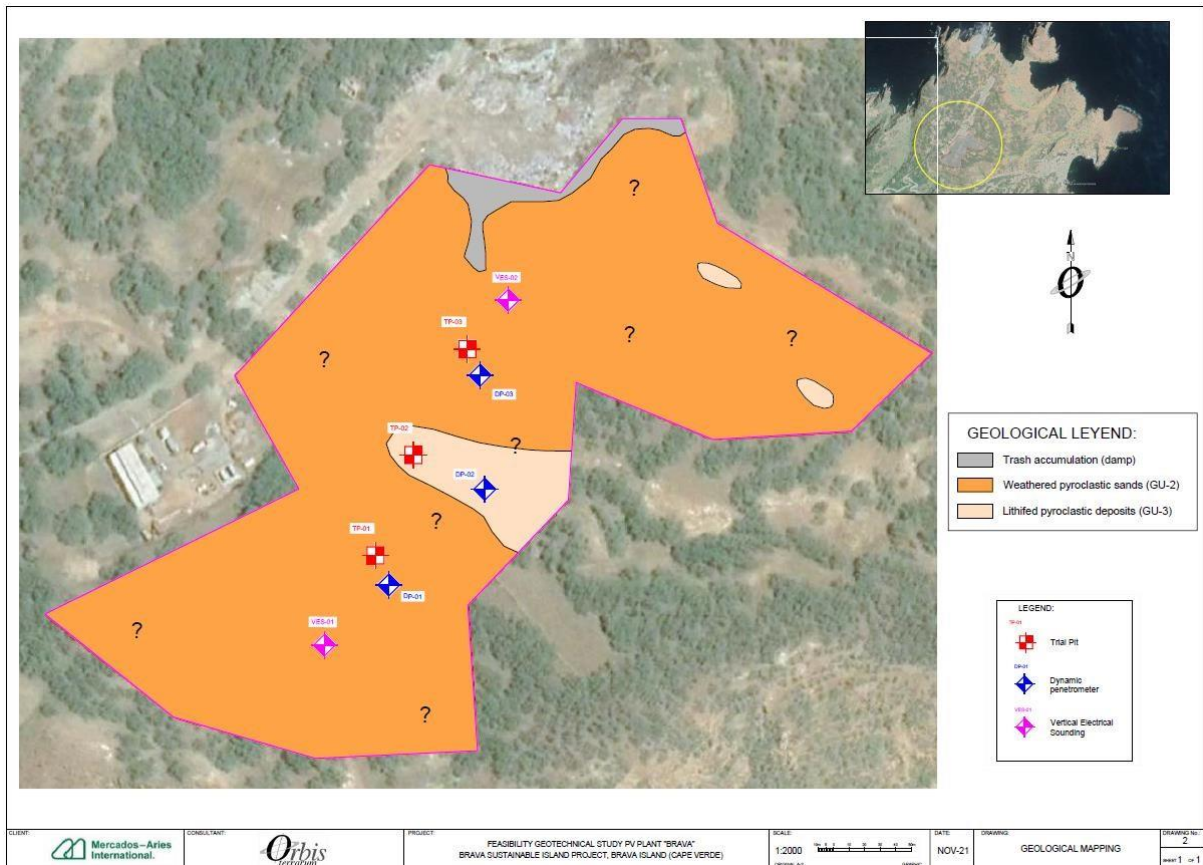


Figure 3- 3- Local geological map

Source: Geotechnical study carried out in the scope of the TA No

signs of extractive activity have been identified in the ZDER.

Geomorphologically, the ZDER area corresponds to a plateau with a gentle slope towards the south-east.

### 3.2.4 Soils

As previously mentioned, the lithological materials that outcrop and that most directly influence the genesis of the soils and their evolution are fundamentally of volcanic origin.

According to Diniz & Matos, 1999, the soils in the ZDER include Phhacozemes háplicos (Phh), Andossolos háplicos (ANh) e Andossolos vítricos (ANz), depending on the topography. These are poor soils that present severe limitations related to the dryness of the environment.

The current uses of the land in the ZDER are, in general, forestation with prosopis and occasional grazing.

### 3.2.5 Water resources

The hydrological regime of the island is strictly related to the rainfall regime, being characterised by a dry season and a rainy season. The rainy season sometimes corresponds

to torrential rains that cause surface currents and transport of solid material that discharges into the sea.

In the implementation area of the ZDER there is no presence of surface water. The local geology and the strong slopes do not allow the accumulation of rainwater that runs or infiltrates directly into the ground. To the east of the ZDER is the Ribeira Achada do Lajedo, which flows into the Baía da Pedrinha, about 700m Northeast of the ZDER.

There is no known groundwater abstraction point in the area of the ZDER implementation.

### 3.2.6 Environmental quality

The main sources of degradation of the environmental quality in the study area are essentially the Favatal thermal power station and the municipal waste dump.



Figure 3- 4- Main sources of environmental quality degradation

The Favatal Thermal Power Plant, which presently assures the electrical production in Brava, with resource to four diesel generators (one of which is presently inoperative).

The storage and handling of fuel and lubricant oils necessary for the operation of the power station are associated with environmental risks, namely soil contamination, in the event of

spills or leakages, despite the recent installation of two new 20 tonnes tanks fitted with a secondary containment.



*Figure 3- 5- Fuel storage at the Favatal Power Station*

The operation of the power station involves the emission of noise and atmospheric pollutants, namely carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), volatile organic compounds (VOC) and particles from the generator engines.



*Figure 3- 6- Generating set exhaust chimneys at Favatal Power Station*

The municipal dump, where the solid urban waste produced on the island is deposited, is currently the main source of environmental degradation in the area. It is a form of waste disposal with limitations in terms of environmental preservation, namely by the absence of any impermeabilization of the soil, by the non-compaction of the waste and its systematic and daily covering, with the aggravating factor of the systematic burning of waste. The dump is not fenced and, as illustrated in Figure 3- 7, partially occupies land within the ZDER.



Figure 3- 7- Waste disposal in the ZDER

In terms of air quality, reference should also be made to the high concentrations of particulate matter (dust) of natural origin that can be found in Cape Verde.

The sensitive receptors, in terms of air quality and noise, closest to the ZDER and in the direction of the prevailing winds (from the NE) are the houses in the Braga area, about 1,300 m to the southwest. Not located in the prevailing wind direction but closer to the ZDER (although at much lower elevations) is the locality of Furna, about 250 m to the South of the easternmost part of the ZDER.

### 3.2.7 Biodiversity

The area under study corresponds to a modified habitat, i.e. where there is a large proportion of plants and/or animal species of non-native origin, and where human activity has substantially modified the primary ecological functions of the territory and the species composition.

As mentioned, this is a very arid climatic zone covered by skeletal soils.

The fieldwork and analysis of the study area revealed that, as it is an arid climatic zone, not very favorable to the diversification of species, the ZDER is mostly covered with *Prosopis juliflora* (American wattle, exotic and invasive), and there are few traces of natural vegetation cover. Also denoted was the occasional occurrence of *Roccella tinctoria* (urzela, or rock beard, as it is known on certain islands of the archipelago), a lichen that was formerly exported for use in the textile industries in Europe for dyeing.



Figure 3- 8- Urzela

The fauna occurring in the area of the ZDER is also poor. No Cape Verde Red List species are referenced for the area, however, it should be noted that there are ongoing surveys that point to the nesting of seabirds, namely Alcatraz (*Sula leucogaster*), Phaeton's Petrel (*Phaeton aethereus*) and Cabo Verde Shearwater (*Calonectris edwardsii*) on the coastal cliffs north of the ZDER.

The ZDER does not interfere with protected areas. The Reserva Integral dos Ilhéus Secos or Rombo (which is part of the National Network of Protected Areas; these islets are also classified as an Important Bird Area - IBA CV 009 - by BirdLife International) is about 8 km to the north.

With regard to ecosystem services, i.e. ecosystem functions that generate benefits and wellbeing for individuals, communities and society in general, it appears that in the study area the provisioning and cultural services provided by the ecosystem are quite low. Also the regulation and support services provided by the ecosystem are, due to the biophysical characteristics of the area under study, quite incipient.

### 3.2.8 Landscape

In the current situation, the area under study presents a landscape with limited scenic value and sensitivity, arid and with an already relevant degree of artificiality in its surroundings, due to the presence of the Power Plant and the municipal garbage dump, besides the forestation with an exotic species (Proposis).

The terrain of the ZDER is relatively little visually exposed.

### 3.2.9 Risks

Using the information contained in the final report of the Project "Analysis and Mapping of Hazards in Cape Verde" (UNDP, 2014), the risks related to slope movements and forest fires are highlighted in this assessment.

With regard to slope movements, the ZDER covers areas with different levels of susceptibility to this type of phenomenon, a fact that is not unrelated to the variation in topography of the area it covers. The areas with greater susceptibility to slope movements closest to the ZDER (but always outside the ZDER) correspond to steeper terrains, in the coastal cliffs.

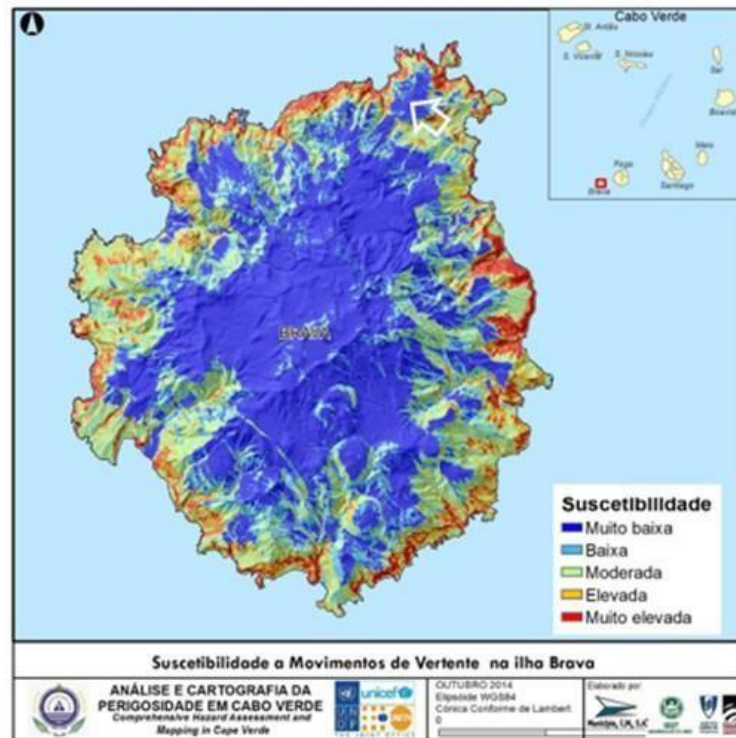


Figure 3- 9- Slope movement risk

With regard to susceptibility to forest fire, the ZDER intersects all susceptibility classes considered, from very low to very high but with a preponderance of areas with greater susceptibility, which is related, on the one hand, to the general aridity of the area and the density of *Prosopis*.

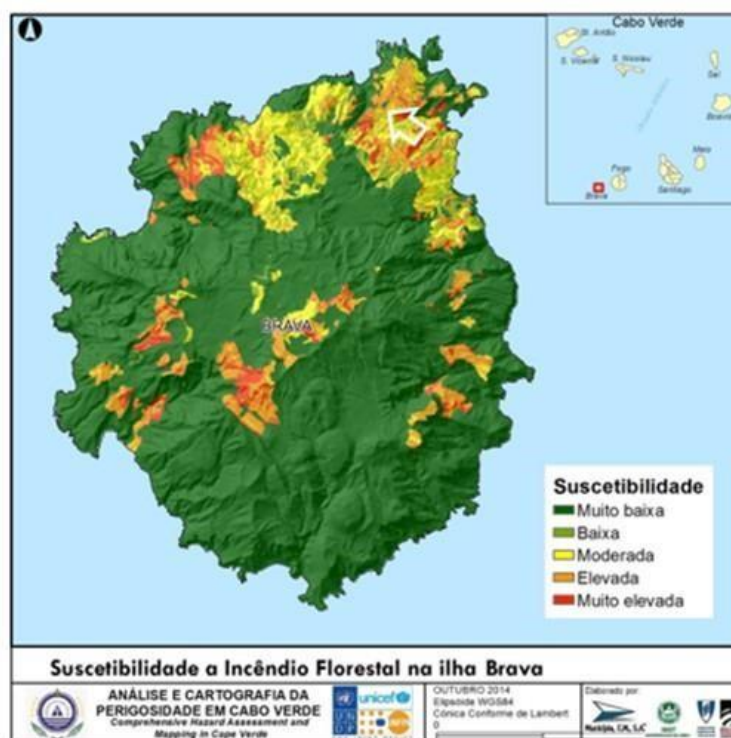


Figure 3- 10- Susceptibility to forest fire

The seismic risk should also be mentioned, which, according to the aforementioned report, is moderate in most of the Brava Island.

### 3.3 Socio-economic environment

#### 3.3.1 Population and living conditions

According to the PEMDS - Municipal Strategic Plan for Sustainable Development (CMB, 2020), the Municipality has a resident population of 5,521 inhabitants, corresponding to 1.1% of the population of Cape Verde, which results in a population density, approximately, in the order of 88.09 inhabitants per km<sup>2</sup>, 49.1% male and 50.9% female. The average age is 31 years (27.5 years for men and 31.1 years for women).

The data shows that the municipality has a marked tendency to lose population (in 1970 the island had around 7,756 inhabitants). The causes that justify this downward trend of the population are related to emigration, mostly to the United States of America, related to family reunification, lack of employment and higher studies in other islands of the archipelago and abroad, and after completing the studies, many young people do not return.

According to the 2010 Census, only 18.8% of the Brava population lives in urban areas (81.2% in rural areas).

According to the PEMDS, 95.1% of the households in Brava have access to electricity, 89.7% have access to piped water, 85.2.3% have a bathroom, 75.6% use containers as a means of disposal of solid waste, 7.6% use firewood and 91.9% use butane gas to prepare their meals.

There is no human settlement in the ZDER area.

The nearest inhabited areas are Furna, about 700m to the east and Braga, about 1 000m to the southwest.

### 3.3.2 Tenure and land use

According to the information available, the land within the ZDER is owned by the State, according to the document presented in the annex c.

### 3.3.3 Cultural heritage

There are no known elements of tangible (movable or immovable property, sites, structures, groups of structures and natural resources and landscapes that have archaeological, palaeontological, historical, architectural, religious, aesthetic, or other cultural significance) or intangible cultural heritage (practices, representations, expressions, knowledge, skills - as well as the associated instruments, objects, artefacts and cultural spaces) related to the area of the ZDER.

The presence of the ruins of a chapel in the vicinity of the ZDER, in a place not likely to be affected by the project, should be noted.



*Figure 3- 11- Ruins of a chapel (outside the boundaries of the ZDER)*

### 3.3.4 Spatial Planning

According to the Basic Law for Spatial Planning and Urban Development, land use planning in Cape Verde is promoted through Land Use Plans (National Spatial Planning Directive - DNOT, Regional Spatial Planning Scheme - EROT, Special Land Use Plan – PEOT, all acronyms in Portuguese) and Urban Plans (Municipal Master Plan - PDM, Urban Development Plan - PDU, Detailed Plan – PD, again, all acronyms in Portuguese). The PDU and PD are developed in previously defined areas of the main urban nuclei, constituting a basic element of control of the urban planning requirements imposed on a given area of the national territory.

For the environmental characterisation of the reference situation of the ZDER implementation areas it is important to consider the following legal figures of territorial planning and management:

- Urban Planning (EROT, PDM, PDU, PD);
- Environment (protected areas);
- Infrastructure (public networks);
- Tourism Planning (Integrated Tourism Development Zones – ZDTI, in Portuguese).

The ZDER was formally established as a reserve area that meets the necessary conditions to host photovoltaic energy harnessing projects.

In the zoning plan of the PDM of Brava (ratified in 2013), the area where the ZDER was established is mostly inserted in the class "forest area", so the change of use inherent to the use of photovoltaic energy must be assumed, in accordance with what is foreseen in the PESER. No interference with any other planning instrument has been identified.

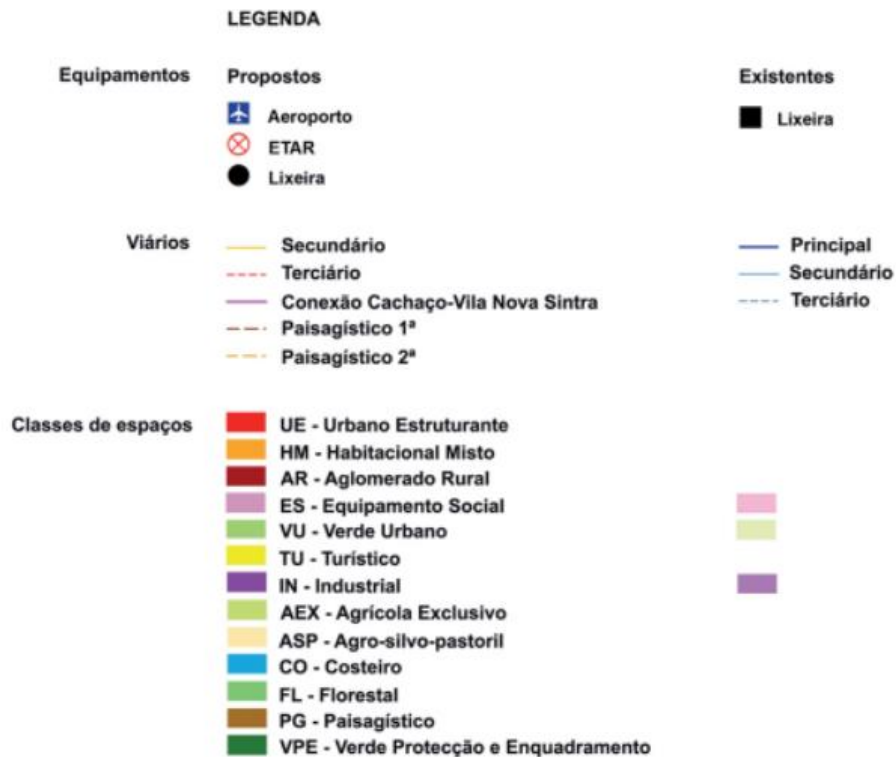


Figure 3-12- Extract of the Municipal Master Plan of the PDM of Brava (2013) with the inclusion of the ZDERZ

As previously stated, the ZDER does not interfere with any protected area.

Likewise, despite its proximity to the Favatal Power Station and the EN3-BR-01 national road, the area of intervention does not interfere with land use planning in terms of these infrastructures.

According to information collected from local authorities, the Favatal area has long been identified as a possible alternative for the location and development of an airport infrastructure due to the lack or almost non-existence of alternatives due to the topographical constraints of the island. In the land-use plan of the Brava PDM the location of the possible airport infrastructure is represented in a symbolic and indicative way, not being defined any aeronautical easements in compliance with Regulation No. 04/AED/2017 of 11 August. During the preparation of the PESA, contacts were made with the entities with competences at the level of airport infrastructures, and it was found that there are still no concrete elements on a possible airport project and its implementation.

Regarding tourism, Law No. 75/VII/2010 of 23 August establishes the legal regime for the declaration and operation of Special Tourism Areas. According to the same legislation, Special Tourism Areas are areas identified as possessing special aptitude and vocation for tourism based on their endogenous potential or with significant potential for future tourism development. The Strategic Plan for Tourism Development of Cape Verde 2010-2013, (PEDT), does not include any ZDTI for the island of Brava.

### 3.4 Stakeholder consultation

In the scope of preparation of the PESA of the wind and solar ZDER areas, contacts were made with institutions and local communities, with emphasis on the general meeting held on 12 May 2021 in the main hall of the Municipal Chamber of Brava, with the participation of 21 people (4 women and 17 men), community members and representatives from various institutions (City Council and Municipal Assembly of Brava, Delegations of the Ministries of Education and Agriculture and Environment, Fogo/Brava Regional Development Office, Project for Socio-Economic Opportunities in the Rural Environment - POSER, Red Cross, Nossa Senhora do Monte Primary School, Electra, Água Brava and economic agents).

This session aimed to socialize the ideas of the future Parks (solar and wind), collect data and information related to the elaboration of the environmental and social safeguard instruments.

The following main questions were raised:

*Table 3.1- Summary of stakeholder consultations*

General questions	Answers
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Where will the ZDERs and the interconnection corridors to the public electricity grids be located. When will the execution of the works begin?	The reserve areas of the development areas of the Furna Solar ZDER, Furna Wind ZDER and the Interconnection Corridors to the Public Power Networks are located in the town of Favatal, Brava Island, as indicated in the maps presented. They are served by national road EN3-BR-01 (Furna/Nova Sintra). The corresponding occupied areas/spaces are as follows:
<b>General questions</b>	<b>Answers</b>
	ZDER Solar de Furna: 6 hectares Windy Ventos de Furna ZDER: 37 hectares Interconnection Corridors to Public Power Networks: (Cable buried along the existing carriageway. Approximate length: 1,659 m).
Will the construction of the Solar and Wind Parks make it impossible to build an airport in the area, as the entire population of the island of Brava desires?	The areas to be used are small and will not prevent the construction of an airport, if the potential / conditions of the Favatal area are confirmed. All the necessary measures must be taken in order not to make the construction of an airport infrastructure unfeasible. All the necessary efforts will also be made to make the renewable energy development projects compatible with other projects that may be developed in order to minimize possible interferences.
Who are the funders?	The basic studies were financed by the LuxembourgLuxDev Cooperation and the implementation project will be financed by the Government of Cape Verde. The parks will be financed through public-private initiatives.
What are the advantages of the Project?	The project will provide a reduction in production costs (use of solar or wind energy), although it may take some time. The use of production through energy will allow the concession holder to reduce tariffs. The tariffs will be set by the Government in accordance with the legislation in force.
Will the whole island benefit?	Since there is a single plant and the public network is interconnected, the project will benefit the entire island.

The following main recommendations were noted:

- Take into account the importance of an airport infrastructure, both for the mobility of people and goods, and for issues related to civil protection, given the high seismicity of the island and the consequent threats of natural disasters;
- Given the climatic and topographic characteristics of the island and the fact that the Favatal area is considered one of the few alternatives (if not the only one) on the island for the construction of an airport infrastructure, all measures should be taken in order not to make its construction unfeasible, should the studies confirm these potentialities;
- Make reserve areas and renewable energy development projects compatible with reserve areas for the development of possible airport infrastructure in order to minimise possible interference;
- Reduce the energy costs of families, given the relevant weight on family income and the quality of life of the population;

## 4 Analysis of environmental and social risks and impacts

### 4.1 Methodological approach

The identification and assessment of the main risks and impacts potentially associated with the use of solar energy in the ZDER was done based on the actions that will occur in the development of the photovoltaic park (the primary causes of impacts, described in chapter 2) and the biophysical and socio-economic factors (characterisation presented in the previous chapter) on which these actions could produce effects.

Given that the details and specifications of the future photovoltaic plant are not yet available, the identification and assessment of risks and impacts are carried out in a relatively generic way and are shorter than that normally applied in an environmental impact assessment of a detailed project.

Essentially, the analysis carried out aims to highlight the potentially most significant risks and impacts in order to:

- Identify from the outset if there are any risks or impacts so serious (significant) that they would advise against the development of the park for environmental or social reasons;
- If this is not the case (i.e. there are no environmental or social reasons that would make the park unviable), to achieve a better focus on the environmental and social management initiatives to be carried out in the course of the PV park development process.

In view of these objectives, it is pertinent to clarify how the significance of the identified risks and impacts was attributed. The following table aims to explain these criteria:

*Table 4.1- Criteria for assigning significance to impacts*

Meaning	Description	Measures
Low (negligible risk or impact)	Environmental or social change is expected, but the consequence of the risk or the magnitude of the impact is small and well within acceptable standards, and/or the receptor is of low sensitivity/value. Spatially and temporally limited risk or impact	Mitigation of risks and negative impacts not essential, but good practices must always be observed. Measures to enhance positive impacts should be considered if they involve an effort compatible with the expected benefit
Medium or moderate (significant risk or impact)	Risk or impact that may exceed acceptable limits and standards and/or the receptor is moderately sensitive/valuable.	Necessary mitigation of risks and negative impacts and justifiable enhancement of positive impacts
High (very significant risk or impact)	Risk or impact where acceptable limits or standards may be grossly exceeded, or where major changes occur to highly valued/sensitive resources/receptors. Impacts that may last over the long term or affect a large area.	If the risks or negative impacts cannot be mitigated, intervention at the Project decision level may be justified.

Thus, the following sections present the analysis of risks and impacts relative to various biophysical and socio-economic factors. Whenever justifiable, a differentiated analysis was made for the construction phase and for the operation phase for each of the factors, having also prepared a joint analysis for the decommissioning phase. At the end, a summary of the analyzed risks and impacts is presented.

## **4.2 Climate**

### **4.2.1 Construction phase**

No notable climatic or microclimatic impacts are expected as a result of the construction works.

### **4.2.2 Operation phase**

The PV plant in question is not expected to have microclimatic effects.

Internationally available experience, although still relatively recent, indicates that photovoltaic parks can have microclimatic effects. These effects can be felt at very short distances from the panels, namely in the atmospheric layer immediately above the panels and between the panels and the ground.

Indeed, it is to be expected that during the day the panels and the adjacent air layer will be warmer than the air in the surrounding areas, whereas at night the opposite occurs.

The shading caused by the panels also means that the soil under the panels tends to have lower temperatures than the soil in adjacent areas (without panels).

In any case, the referred effects can be felt at very small distances, probably without going beyond the perimeter of the park. Windy conditions as those prevailing in Cape Verde, further attenuate these effects, by promoting more efficient heat exchange. These facts and the biophysical characteristics and occupation of the area surrounding the park mean that no microclimatic impacts are expected in the operational phase.

On the other hand, the indirect impacts on the climate should be considered through the production of electricity from renewable sources in detriment of the burning of fossil fuels, thus contributing to a global strategy to combat the problem of global warming. The development of the Project, thus, has a positive impact in this scope, whose significance is reinforced by the alignment with the climate change mitigation strategy established by Cape Verde.

From the perspective of adaptation, the planned use of solar energy is not considered vulnerable to climate change, either directly or indirectly. On the other hand, this use will be made without implying any increase in the vulnerability of communities, infrastructures or activities to the effects of climate change.

During maintenance activities on medium voltage switchboard circuit breakers, there is the possibility of the release of SF<sub>6</sub> (sulphur hexafluoride), which has a high global warming potential, 23,500 times greater than CO<sub>2</sub>. However, the replacement/recycling operations for this gas are usually carried out by the manufacturers in their own installations, the quantities found in each piece of equipment are very small, so no notable impacts are to be expected in this respect.

## **4.3 Geology, geotechnics and geomorphology**

### **4.3.1 Construction phase**

Given the reduced expression of earth movements and the geomorphological characteristics of the terrain, it is not expected that the construction works for the implementation of photovoltaic park may imply changes in the morphology of the area under study that could translate into relevant impacts.

In fact, it is expected that the earthworks to be carried out will be very limited, given the ease with which the panels can adapt to the ground, and the excavations to be carried out to dig trenches and for the foundations of the transformer stations, the switching station and the panel support structures (if these are not driven into the ground) will not have any significant effect on the geology and geomorphology or increase any risk of soil erosion.

The results of the geotechnical study of the ZDER carried out as part of the TA lead to the conclusion that the characteristics of the land are suitable for the installation of the photovoltaic park, and the final engineering studies should include confirmation of the specific conditions in the areas to be actually occupied.

### **4.3.2 Operation phase**

It is not expected that the presence of the panels under the conditions envisaged in the ZDER zone will give rise to any relevant impacts on the geology and geomorphology.

## **4.4 Soils and land use**

As previously mentioned, the soils in the study area are very incipient and with low agronomic aptitude. Therefore, the pedological sensitivity of the study area is very low and in the current situation there is no built occupation or economic activity.

### **4.4.1 Construction phase**

The clearing of the land and the planned construction work will have no significant impact on the already non-existent agronomic characteristics of the soil.

On the other hand, it should be considered that in the construction phase, construction site activities are likely to generate water contaminated with hydrocarbons, heavy metals, suspended solids and organic matter, which could cause soil contamination if measures are not taken to control these effluents by sending them to appropriate treatment or recovery

systems, and to control the conditions of storage and use of hazardous substances and waste. The adoption of prevention and correction measures to mitigate these potential impacts is therefore justified, as presented in a separate chapter.

The correct implementation of these measures means that the potential negative effects on soil quality associated with the operation and functioning of the construction site will not result in significant impacts.

During the construction phase, environmental emergencies may also occur, involving the spillage of dangerous substances into the ground, namely diesel, petrol, hydraulic oil and lubricating oil. The reason for the occurrence of a spill may be an accidental situation, such as the rupture of a hydraulic tube of a machine, poor handling of substances, namely during supply operations or maintenance operations. Although the extent of the effect of such a situation is difficult to determine, the possible occurrence of a spillage of hazardous substances may have a negative effect on soil quality and thus give rise to a significant impact, depending on the quantities and characteristics of the substances involved. In this case also, the application of appropriate prevention and control measures will be justified.

In any case, the extremely low productive capacity of the soils on the site and the absence of exploitable water resources (see below) contribute to a very low sensitivity of the natural environment to impacts of this type.

#### **4.4.2 Operation phase**

In the operation phase, the land occupation that started with the construction works will remain. Therefore, no additional relevant impact on soils is expected.

Similarly to what was referred to for the construction phase, environmental emergencies may also occur in the operation phase, involving the spillage of hazardous substances into the soil during maintenance operations at the photovoltaic park. The predictably low maintenance needs mean that the probability of this type of occurrence is very low. However, once again, the adoption of adequate measures for its prevention and the creation of an appropriate emergency plan will be a determining aspect for the mitigation of these risks.

### **4.5 Water resources**

First of all, it should be noted that there are no known water resources (underground or surface) in the study area that are, or have the potential to be, exploited.

#### **4.5.1 Construction phase**

As already mentioned in relation to soils, during the construction phase, construction site activities are likely to generate water contaminated with hydrocarbons, heavy metals, suspended solids and organic matter, which may contaminate the water environment (surface and groundwater). The adoption of prevention and control measures to mitigate these potential impacts is therefore justified, as presented in a separate chapter. The correct implementation of these measures means that the potential negative effects on water quality

(surface or groundwater) associated with the operation and functioning of the construction site will not result in significant impacts.

During the construction phase, environmental emergency situations may also occur, involving the spillage of dangerous substances (namely diesel, petrol, hydraulic oil and lubricating oil) onto the ground and, in the limit, such a spillage may reach a water line or infiltrate to the point of affecting subterranean waters. The reason for the occurrence of a spill can be an accidental event, such as the rupture of a hydraulic hose of a machine, poor handling of substances, e.g. during filling operations or maintenance operations. Although the extent of the effect of such a situation is difficult to determine, the possible occurrence of a spill of dangerous substances may have a negative effect on the quality of surface water and/or groundwater and thus constitute a significant impact, depending on the quantities and characteristics of the substances involved and the specific nature of the place where it occurred. The adoption of appropriate measures to prevent this type of occurrence and the creation of a suitable emergency plan will be a determining factor in mitigating these risks, which, at the outset, are reduced due to the limited sensitivity of the water resources.

As no significant changes in the morphology of the land are expected (the earthworks to be carried out will be small) and given the flat topography of the land, it is not expected that, even if heavy rainfall occurs during the works, major erosion phenomena may occur and, consequently, solid transport along the water lines towards the sea.

In summary, during the construction phase negative impacts may occur, but they are of reduced magnitude and partially mitigated. Overall, they are considered to be very insignificant.

#### **4.5.2 Operation phase**

The presence of the photovoltaic park will not result in a significant increase in soil sealing, which is why no significant changes in infiltration capacity are expected.

Similarly to what was referred to for the construction phase, it is also possible that during the operation phase, environmental emergencies may occur during maintenance operations of the photovoltaic park, which could, in theory, affect water resources. The predictably low maintenance needs mean that the probability of this type of occurrence is very low. However, once again, the adoption of appropriate measures to prevent them and the creation of a suitable emergency plan will be a determining factor in mitigating these risks, which are very low given the very limited sensitivity of local water resources.

The most frequent human presence in the photovoltaic park will correspond to the personnel, predictably reduced in number, who will ensure its maintenance and safety. As previously indicated, it is assumed that the septic tank installed during the construction phase will remain active and will receive the waste water during the operation phase.

In summary, it is expected that negative impacts may also occur in the exploration phase, but of reduced magnitude and partially mitigated. Overall, they are considered to be very insignificant.

## 4.6 Air quality

The sensitive receptors, in terms of air quality, closest to the area of the future photovoltaic park and in the direction of the prevailing winds (from NE), specifically the houses in Braga are already a considerable distance away, about 1 000 m. Furna, closest to the eastern part of the ZDER is not in the prevailing wind direction.

On the other hand, the high concentrations of particulate matter (dust) of natural origin that can be found in Cape Verde should be noted.

### 4.6.1 Construction phase

During the construction phase there will be negative impacts on air quality, both due to the construction process and movement of machinery, and due to the increase in vehicle traffic needed to transport materials and workers.

The cleaning and regularization of the land, the digging of trenches and excavations for the foundations, as well as the circulation of vehicles on unpaved roads will give rise to the emission of particulate matter (dust). This dust will disperse in the wind direction (which, most of the year blows from Northeast to Southwest), eventually settling on the ground, the finest at greater distances from the origin, while the coarser dust will settle closer to the place where it originates. It is not foreseeable that even in occasional situations, a temporary increase of dust may occur in the Braga area and even less so in Furna.

Exhaust emissions from the vehicles and machinery involved in the construction work will initially be of very little relevance.

Given the above and the temporary nature of the actions that may cause the emission of atmospheric pollutants, the foreseeable impacts on air quality during the construction phase will be negative but not significant.

### 4.6.2 Operation phase

No negative impact on air quality is expected in the operational phase, given the absence of activities likely to promote the emission of atmospheric pollutants.

On the contrary, the photovoltaic park is expected to have a positive impact, albeit indirect, due to the production of energy from a renewable source, potentially reducing the need to produce electricity by burning fossil fuels and consequent emissions of atmospheric pollutants. This impact will have, however, a reduced significance on the scale of the island and of the country.

## 4.7 Noise and vibrations

In the immediate surroundings of the future photovoltaic park there are no residential areas or other uses particularly sensitive to noise or vibrations.

### **4.7.1 Construction phase**

During the construction phase, some potentially noisy activities may occur, such as the digging of trenches and excavations for foundations. However, the absence of sensitive receptors in the immediate surroundings of the park constitutes, from the outset, sufficient reason not to expect any relevant impacts.

Some of the activities mentioned above (e.g. excavation of rock material) may also give rise to vibrations, which may be felt at short distances. The absence of dwellings or other sensitive structures in the immediate vicinity of the park means that no impacts are expected.

### **4.7.2 Operation phase**

During the operation phase no noisy activities or equipment will take place, therefore no impact in terms of noise is expected.

The same consideration in relation to vibrations.

## **4.8 Landscape**

In the current situation, the area where the future photovoltaic park is planned to be located presents a landscape with limited scenic value and sensitivity, arid and with an already relevant degree of artificiality, but with a relevant visual exposure.

### **4.8.1 Construction phase**

During the construction phase, several activities will take place that will imply changes in the park area, with the carrying out of earth movements (without foreseeing relevant changes in the topography) and the installation of fencing, panels and support facilities (transformer and switching stations). In this way, there will be a change in the visual/aesthetic perception of this area, observable from the road but also from larger areas in the surroundings.

This change will have a negative impact on the landscape, but this will be insignificant and difficult to mitigate.

### **4.8.2 Operation phase**

In the operation phase, the presence of the artificial structures introduced in the construction phase will become definitive.

The panels will have an important intrusive effect on the landscape (due to their linearity, colour and reflectivity). It is, therefore, an alteration of the landscape at local level and with relatively restricted views, corresponding to a minor impact and difficult to mitigate.

## **4.9 Biodiversity and ecosystem services**

As previously mentioned, the future photovoltaic park is located in an area corresponding to a modified habitat, and where human activity has substantially modified the territory's primary ecological functions and species composition.

On the other hand, the future park will not interfere with protected areas.

In the study area the provisioning and cultural services provided by the ecosystem are quite reduced, in practice null. Also the regulation and support services provided by the ecosystem are, due to the biophysical characteristics of the area under study, quite incipient.

#### **4.9.1 Construction phase**

The construction works will imply an increase of artificialization of the area under study. However, bearing in mind the above mentioned characteristics of the area, it is not expected that this increase in artificialisation will have a significant negative impact on biodiversity and ecosystem services.

#### **4.9.2 Operation phase**

In the operational phase there will be no relevant additional impact on biodiversity, compared to what occurred previously during construction.

From another perspective, the production of electricity from solar energy corresponds to the use of an ecosystem service, specifically an energy supply service from a renewable source, which translates into a relevant positive impact.

### **4.10 Waste**

#### **4.10.1 Construction phase**

It is considered essential that prior to the beginning of the construction works, CM Brava proceed with the removal of the waste deposited in places that may interfere with the works to be carried out, ensuring healthy and safe conditions for the implementation of the project.

The processes and materials to be used in the construction phase will give rise to waste commonly produced in public works. Among these, we should highlight, due to their potential for contamination, waste oils and, in general, the waste produced in the maintenance operations of the construction machinery. It is also foreseeable that concrete waste will be produced, which, if deposited directly on the ground, will degrade the soil.

Significant quantities of packaging waste (equipment packaging) are expected to be produced, with the assumption that a significant part may have reuse or recycling potential.

Assuming compliance with the legally established provisions and the adoption of good practices, the impacts potentially arising from the production of this waste will not be significant but nevertheless justify the recommendation of specific measures.

It is considered that the impacts associated with the production of waste in the construction phase will be negligible.

#### **4.10.2 Operation phase**

In the operation phase, no significant quantities of waste are expected to be produced.

## 4.11 Cultural Heritage

There are no known elements of tangible or intangible cultural heritage related to the study area.

The geology of the area, the historical context (of Cape Verde in general and of the study area in particular) and the fact that the installation of the photovoltaic park will involve minor land movement, mean that no impacts are expected in this area.

However, in order to safeguard against the discovery of any element of cultural heritage (such as archaeological or historical sites, remains or objects/artifacts, cemeteries or individual graves), specific measures are included in the ESMP that meet World Bank requirements (namely ESS 8) and Cape Verde legal requirements (expressed in Law 85/IX/2020).

## 4.12 Spatial Planning

According to existing information, the intention to develop a photovoltaic project in Furna's ZDER does not conflict with land use planning instruments that have been approved or are under development, so no impacts on land use planning are expected.

## 4.13 Physical or economic displacement

As previously stated, the plot of land does not currently support any built occupation or economic activity.

No impacts in terms of physical or economic displacement are foreseen.

## 4.14 Employment and livelihoods

### 4.14.1 Construction phase

During the construction phase, temporary jobs will be created for civil construction, transport and equipment assembly activities. The significance of the impacts thus generated will necessarily depend on the number of jobs involved, the duration of the work and, from a geographical perspective, the proportion that can be secured locally or nationally.

Estimates of the number of jobs to be created during the construction phase are not yet available, but it is accepted that there may be an average direct occupation of no more than 50 people over about 6 months and a number of indirect jobs probably of the same order of magnitude. These figures need to be confirmed in the context of the detailed studies of the photovoltaic park.

Some of these jobs can certainly be filled by local staff (from the island) or national staff (from other islands), but others may have to be filled by staff with specialization requirements that

may not be available in the country. It is assumed, at the outset, that there are no constraints in terms of gender equity in access to most of the jobs to be created.

The relatively modest job creation and the fact that this is a temporary situation means that this impact, although positive, cannot be considered significant.

The reduced expression of the temporary jobs to be created does not allow us to foresee very important effects in terms of lifestyle, habits and customs of the local communities. It is important to highlight that these communities are used to deal with migratory phenomena, namely Bravenses who emigrate and then return to their island with other habits and customs and, with less expression, immigrants from other islands or even from abroad and who settle in Brava. The tourism activity in Brava, although still relatively little intense, has also provided some habituation of the local communities to the contact with other habits and customs. In other words, even if all the labour to be created was filled by workers coming from other islands or even from abroad, it is considered that it is not foreseeable the occurrence of relevant impacts on the ways of life, uses and customs of the local communities.

Since 2011, Cape Verde has a relevant legal instrument on gender-based violence (GBV) and the actions taken to raise awareness and prevent GBV have had positive effects.

Any infrastructure project always has some potential to induce risks on the GBV. In this particular case, the Project is considered to have a low risk, given the predictably limited scale of the potential labour influx and the adaptive capacity of the local community which is reasonably sensitised.

In any case, the HSEP has a specific section dedicated to the prevention and mitigation of GBV risks.

#### **4.14.2 Operation phase**

In the operational phase, permanent and continuous local jobs will be created, in addition to the external labour that may be required by equipment suppliers.

Thus, at the local level, it will be necessary, at least, to ensure vigilance, cleaning and current maintenance activities. As no estimates are yet available regarding the number of jobs to be created, it can be admitted, however, that this number may be modest, probably less than 10, admitting, from the outset, the inexistence of constraints regarding gender equity in the access to most of the jobs to be created.

Considering the reduced number of jobs, the impact on employment in the operation phase, even if positive, will be of reduced significance. Also in this phase no relevant impacts on the ways of life, habits and customs of the local communities are foreseen.

The risks related to GBV previously indicated as low in the construction phase will be even lower in the operation phase. In any case, the prevention measures indicated in the ESMP will essentially apply.

## **4.15 Occupational Health and Safety**

### **4.15.1 Construction Phase**

During the construction phase the workforce will be subject to risks of injury linked to various construction machinery and handling operations. In this case, the site does not require any work at height. Injuries are therefore intrinsically linked to construction equipment, mainly trucks and other surface preparation equipment. The risks also concern possible accidents when vehicles are moving around the site or at the entrance to the site. Without prejudice to the need to adopt appropriate preventive measures, it should be noted that the increase in traffic associated with the work will be modest and temporary and very insignificant.

During this phase, the main electrical hazards exist during the first commissioning and testing of the installation. The electrical risk is then linked to the presence of live electrical works as soon as they receive solar radiation (risk of electric shock). This risk primarily concerns the personnel employed on the site.

All these risks will need to be considered in the preparation and implementation of the Health and Safety Plan for the construction phase.

### **4.15.2 Operation Phase**

During the operation phase, the risk of harm to people is very low given the absence of personnel on the site for most of the time. However, when personnel come to the site for inspection or maintenance, the risk cannot be completely ruled out. It would then be either linked to the electrical equipment, a possible fire outbreak or linked to an error in handling the equipment (risk of injury or pollution).

During normal operation, the electrical risk is reduced because the PV plant is closed and rarely frequented. However, during servicing and maintenance operations, the risks likely to concern the personnel must not be neglected. The main dangers are due to the presence of live electrical works as soon as they receive solar radiation.

Solar PV panels are close to the ground and do not constitute points preferentially struck by lightning. The protections implemented comply with the Technical Specifications relating to the protection of people and property and include the interconnection of masses and earthing, as well as the installation of various types of surge arresters.

The Health and Safety Plan to be prepared for the operation phase will systematically address the risks associated with this phase.

## **4.16. Community health and safety**

The fact that there are no inhabited areas or school facilities in the immediate vicinity of the future PV plant is a positive aspect in relation to the risks that its development could potentially have on the health and safety of the communities.

It should also be noted that the park will not be located in an area particularly vulnerable to natural hazards.

#### **4.16.1 Construction phase**

During the construction phase, the circulation of machinery and vehicles involved in the works will increase the likelihood of accidents. Without prejudice to the need to adopt appropriate prevention measures, it should be noted that the increase in traffic associated with the work will be modest and temporary and very slight compared to the traffic on the EN3-BR-01 road.

On the other hand, it should be considered that the area where the works will take place (the area of the future park) will have an increased risk (due to the presence of machinery in operation, excavations and other dangers), which justifies starting precisely by fencing it off and controlling the access of unauthorised personnel.

The absence of inhabited areas or school equipment in the immediate vicinity implies a very low presence of people (and in particular, children) in the area, which also contributes to the consideration that the health and safety risks for the communities will be reduced during the construction phase.

Construction works are not expected to increase the vulnerability of communities, infrastructure or activities to the effects of climate change or any other natural hazards.

This assessment has been prepared in the midst of the Covid-19 pandemic situation and it is not possible to anticipate how the constraints associated with the disease will evolve and therefore what will happen when the project is implemented.

Therefore, it would be sensible to foresee that when drawing up the documents for the construction contract for the photovoltaic park, a set of specific measures to be taken into account by all stakeholders should be foreseen. Guidelines to this effect are presented in the ESMP.

#### **4.16.2 Operation phase**

Taking into account the proximity of the future photovoltaic park to a hypothetical airport infrastructure, it should be noted that the reflectivity of sunlight on photovoltaic panels and the potential risks for aeronautical safety is an issue that has deserved international attention, along with the possibility of generating electromagnetic interference by the DC cabling and inverters present in the parks.

However, international literature indicates that photovoltaic panels may reflect only 2% of the incident sunlight, depending on the angle of the sun and assuming they are fitted with anti-reflective coatings (Plante et al., 2010). On the other hand, the application of shielded switchboards, shielded cabling and filters or shielding of inverters are measures which, together with distance from navigation systems, are examples of effective measures to prevent possible electromagnetic interference.

In the event that there are any timely developments on the implementation of the airport infrastructure, it is assumed that these aspects will be duly taken care of in the development of the detailed engineering studies for the photovoltaic park, with the solutions being subject to authorisation by the aeronautical authority, as required by regulation and, under this assumption, it is considered that the risks will be acceptably low.

During the operation phase, the presence of the photovoltaic park implies the existence of live elements, i.e. electrical risks. As previously mentioned, the facilities will have an earthing network and other safety devices, but the potential risk of accidental contact will always exist, especially if unauthorised personnel enter the perimeter of the facilities. Also in this case, the absence of inhabited areas or school equipment in the immediate vicinity of the park implies a very reduced presence of people (and, in articulate, of children) in the zone, which, together with the fence, also contributes to consider that the risks of accidental contacts with live elements are reduced.

It should be noted, however, that the presence of equipment and materials (e.g. electrical cables) with high economic value may lead to vandalism / theft, which reinforces the importance of fencing and security (through human means or electronic surveillance). As in the case of other comparable facilities in Cape Verde to date, the hiring of unarmed private security teams is envisaged. In any case, the security services to be used will apply the requirements expressed in the national legislation (Law No. 50/VII/2009) and ESS 4.

The line to be built to connect the photovoltaic plant to the electricity grid also has inherent risks of accidental contact, but also of human exposure to electromagnetic fields.

The fact that there is no human occupation (namely residential or equivalent) in the immediate surroundings of the park allows us to consider these risks as reduced, adding, in the case of electromagnetic fields, the fact that these risks are typically more pertinent in the case of very high voltage lines (more than 110 thousand Volts), while in the case in question, the connection to the grid will be at a much lower voltage.

The potential reduction of fossil fuel electricity generation and inherent reduction of atmospheric pollutant emissions translates into a positive impact on the health of the communities on the island, although the impact is not expected to be very significant.

It is possible that during maintenance activities, breakers may be accidentally damaged and SF6 release may occur. This gas, under normal conditions of pressure and temperature, is non-flammable, colorless odorless, non-poisonous, chemically stable and operates in a closed circuit. The replacement/recycling operations of this gas are usually carried out by the manufacturers on site and the quantities found in each piece of equipment are very small, so that the risks to the health and safety of the communities, including park workers, will be reduced.

The operation of the PV plant is not expected to increase the vulnerability of communities, infrastructure or activities to the effects of climate change or any other natural hazards.

In summary, it is not expected that the operation of the photovoltaic park will have significant impacts or risks for the communities.

It should be noted, from a different perspective, that associated with the presence of the photovoltaic park and considering that the area of the ZDER and its surroundings are susceptible to forest fires, specific measures must be foreseen so that the presence and operation of the project does not worsen this risk and so that the photovoltaic park is protected from forest fires that may occur in its vicinity.

## 4.17 Risks and impacts in the decommissioning phase

The main actions generating impacts during the decommissioning phase of the photovoltaic park will correspond to the dismantling of infrastructures.

Thus, we must expect an increase, temporary and of shorter duration than in construction, in the movement of vehicles, machinery and people. This increase will be associated with the same types of risks and impacts analysed for the construction phase, which are generally not very significant.

Given that during the construction phase there will have been no major earth movements (excavations or embankments), the morphology of the land will remain essentially unchanged. The removal of the artificial structures, especially the panels which occupied a considerable area, will have a positive but not very significant impact on the landscape.

The impacts on biodiversity will be negligible, but a slight positive impact can be admitted, depending on the implementation of an environmental requalification plan and if the future use of the park area has a component of promotion of natural values.

An environmentally relevant aspect of the decommissioning phase is the waste that may then be produced. However, it should be noted that most of the materials used in photovoltaic parks, including the panels, are potentially reusable or recyclable. The metallic structures and electric cables also have great potential for recovery. Therefore, assuming that appropriate waste recovery schemes will be adopted in the decommissioning phase, no significant impacts are expected in this area.

A special note for transformers, if they are oil-cooled: decommissioning and removal must be carried out with the necessary care to prevent oil spills and consequent soil contamination. This could be one of the main environmental risks potentially associated with decommissioning.

The deactivation of the photovoltaic plant will mean the loss of the few jobs associated with its operation. The personnel to be laid off will have training that should facilitate their reintegration into the labour market, so this impact is expected to be minor. On the other hand, decommissioning activities will naturally require some labour, part of which may be provided locally. However, given that this will be a temporary and short-term situation, the positive impact will be negligible.

On the whole, the risks and impacts foreseeable during the decommissioning phase will be insignificant, and no particularly serious environmental or social situation should be highlighted.

## **4.18 Summary of risks and impacts**

The results of the analysis of the previous sections indicate that no risks or impacts on the biophysical or socio-economic environment have been identified that might raise doubts about the sustainability of the PV plant.

The following page presents a summary matrix of the analysis of risks and impacts associated with the photovoltaic park in the Furna ZDER, also containing indications on the mitigation measures that are considered justifiable in view of the results of this analysis.

The criteria for assigning significance to risks and impacts are as described in section 4.1.

PRELIMINARY ENVIRONMENTAL AND SOCIAL ASSESSMENT

Table 4-2- Summary table of risks and impacts

Environmental and social factors	Construction		Operation		Deactivation	
	Evaluation	Comments / mitigation guidance	Evaluation	Comments / mitigation guidance	Evaluation	Comments / mitigation guidance
<b>Climate</b>		Risks and impacts not identified		Alignment with Cape Verde's climate change mitigation strategy		Risks and impacts not identified
<b>Geology, geotechnics and geomorphology</b>		Risks and impacts not identified		Risks and impacts not identified		Risks and impacts not identified
<b>Soils and land use</b>		Justifiable mitigation of possible pollution situations (spills and waste water)		Justifiable mitigation of possible pollution situations (spills and waste water)		Justifiable mitigation of possible pollution situations (spills and waste water)
<b>Water resources</b>		Justifiable mitigation of possible pollution situations (spills and waste water)		Justifiable mitigation of possible pollution situations (spills and waste water)		Justifiable mitigation of possible pollution situations (spills and waste water)
<b>Air quality</b>		Justifiable mitigation (vehicle and machine condition and dust control)		Decreased burning of fossil fuels (emissions reduction)		Justifiable mitigation (vehicle and machine condition and dust control)
<b>Noise and vibrations</b>		Not expected to affect sensitive receptors		No significant impact on sensitive receptors expected		Not expected to affect sensitive receptors
<b>Landscape</b>		Impact difficult to mitigate		Impact difficult to mitigate		Depends on the future use of the land
<b>Biodiversity and ecosystem services</b>		Modified habitat. Missing/incipient ecosystem services		Photovoltaic production corresponds to the use of an ecosystem service (provision)		Depends on the future use of the land
<b>Waste</b>		Justifiable mitigation (waste management, excavation materials and concrete remains)		Justifiable mitigation (waste management)		Justifiable mitigation (waste management and maximisation of material recovery)
<b>Cultural Heritage</b>		Procedure for dealing with very unlikely discovery of archaeological remains		Risks and impacts not identified		Risks and impacts not identified
<b>Spatial Planning</b>		Project compatible with spatial planning instruments		Project compatible with spatial planning instruments		Project compatible with spatial planning instruments

PRELIMINARY ENVIRONMENTAL AND SOCIAL ASSESSMENT

Environmental and social factors	Construction		Operation		Deactivation	
	Evaluation	Comments / mitigation guidance	Evaluation	Comments / mitigation guidance	Evaluation	Comments / mitigation guidance
Physical or economic displacement		State land, without occupation or economic activity		State land, without occupation or economic activity		State land, without occupation or economic activity
Employment		Increase in temporary employment. Justifiable to favour local labour, to be trained		Creation of a small number of jobs. Possible recourse to local labour, to be trained		Loss of few jobs (operation staff) and creation of temporary jobs (decommissioning work)
Ways of life		Justified prevention of GBV		Justified prevention of GBV		Justified prevention of GBV
Occupational Health and Safety		Justifiable mitigation (Health and Safety Plan)		Justifiable mitigation (Health and Safety Plan)		Justifiable mitigation (Health and Safety Plan)
Community health and safety		Justifiable accident prevention and emergency preparedness		Justifiable risk prevention (electrical, vandalism / theft) and emergency preparedness. The use of security teams should comply with the principles of proportionality, good international practice and applicable legislation		Justifiable accident prevention and emergency preparedness



Unidentified risk or impact



Minor negative risk or impact



Risk or significant negative impact



Very significant negative risk or impact



Minor positive risk or impact



Significant positive risk or impact



Very significant negative risk or impact



The negative risks and impacts analysed will not be significant and it is expected that the development of the ZDER will even provide some positive impacts, especially in terms of reducing dependence on fossil fuels for the production of electricity on the island of Brava, mitigating the emission of greenhouse gases and improving air quality.

The use of the intended area for electricity production from solar energy corresponds to a relevant use of an ecosystem service, specifically an energy supply service from a renewable source, without this having as a counterpart the loss of any other relevant ecosystem service, which translates into a relevant positive impact.

No relevant impacts specifically associated with the connection of the future photovoltaic plant to the public electricity grid (at the Favatal Power Plant) have been identified. This connection will be very short and will be made by buried cables along the existing access roads and those to be created within the ZDER. On the other hand, as described in this study, the ZDER does not present particular sensitivity from the biophysical and socio-economic point of view.

In view of the risks and impacts analysed, it is not considered justifiable to consider possible alternative locations for the ZDER. Considering that the total area of the ZDER is substantially greater than that which will be necessary for the installation of the intended power, it is recommended that priority be given to land closer to the power station.

The non-development of the project in the ZDER, the so-called zero alternative, would go against the development strategy for renewable energies in Cape Verde and would make its contribution to the Project's objectives unfeasible.

Taking reference to the Environmental and Social Standards (ESS) that are contained in the World Bank's new Environmental and Social Framework, the following can be said about the implications that the development of the ZDER has in relation to these standards:

- Environmental and Social Standard 1. Assessment and Management of Social and Environmental Risks and Impacts: the AASP of the ZDER and the present assessment aim to provide a procedural response to the requirements of this ESS, corresponding to a first stage of the assessment of the management of risks and impacts, without prejudice to an in-depth assessment that will be carried out in the subsequent stages of design and implementation of the photovoltaic park. In any case, no significant negative risks and impacts were identified at this stage that may raise doubts about the sustainability of the photovoltaic park in the ZDER;

- Environmental and Social Standard 2. Labour and Working Conditions: the creation of jobs in the construction and operation of the photovoltaic park will be relatively small and, as such, its impact will be negligible. Some risks or negative impacts were identified in both stage, taking into account the requirements of this ESS;
- Environmental and Social Standard 3. Resource Efficiency and Pollution Prevention and Management: the use of solar energy for electricity production has, in general and specifically in the current context of Cape Verde, a strong alignment with resource efficiency. No significant negative risks or impacts have been identified in terms of pollution but there will nevertheless be a need to implement measures to prevent possible soil contamination;
- Environmental and Social Standard 4. Community Health and Safety: it is expected that the development of the photovoltaic park will not involve significant health and safety risks or impacts for the communities. The presence of electrical risks will merit specific management measures and, on the other hand, the need to safeguard the facilities from possible intrusion and theft will require the use of security services to protect the facilities, which should meet the requirements of this ESS (namely those in its section B, paragraphs 24 to 27);
- Environmental and Social Standard 5. Land Acquisition, Land Use Restrictions and Involuntary Resettlement: the ZDER does not currently support any built occupation or economic activity. Taking this into account and also the fact that the land is state owned, no impacts in terms of physical or economic displacement are anticipated;
- Environmental and Social Standard 6. Biodiversity Conservation and Sustainable Management of Living Natural Resources: the development of the photovoltaic park will not implicate any natural or critical habitat or any area legally protected and internationally recognised for its high biodiversity value. Similarly, it is not expected to have any effect in terms of the introduction of invasive alien species or interference with the sustainable management of living natural resources. Impacts on avifauna and bats are expected to be minor. The generation of electricity from photovoltaic energy corresponds to the use of an ecosystem service, specifically an energy supply service from a renewable source - solar energy, which translates into a relevant positive impact, especially if we consider that this will be achieved without penalizing another service currently provided by the local ecosystem;
- Environmental and Social Standard 7. Historically Disadvantaged Indigenous People/Traditional Local Communities of Sub-Saharan Africa: not applicable in the Cape Verde context;

- Environmental and Social Standard 8. Cultural heritage: no relevant risks or impacts have been identified. In any case, the possibility of discovery of any element of cultural heritage must be avoided, with the adoption of specific measures established in the ESMP;
- Environmental and Social Standard 9. Financial Intermediaries: not verified within the scope of this evaluation;
- Environmental and Social Standard 10. Stakeholder Engagement and Disclosure of Information: During the preparation of this study, the involvement of stakeholders was triggered, in a manner considered proportional to the nature and size of the Project, as well as its possible risks and impacts. The expectations of the interested parties in relation to the Project are generally positive, namely in relation to the use of local labour and the reduction of the cost of electricity, and no notable concerns were expressed.

## 5 Environmental and social mitigation measures and monitoring

The analysis of environmental and social risks and impacts carried out did not lead to the identification of the need to implement complex monitoring plans for any specific environmental or social component.

However, it will be necessary to monitor the implementation of the recommended environmental and social management measures and to verify whether these measures produce the expected results.

In general, the following mitigation measures will be monitored

*Table 5.1- Summary table of mitigation measures for the construction phase*

### Measures for the Construction Phase

Risks and Impacts on:	Measures related to:
<b>General</b>	Staff Training and Awareness
<b>Geology, Geotechnics and Geomorphology</b>	Execution of Works Use of borrow pits
<b>Soils and Land Use</b>	Construction yard location and operation Waste and wastewater Management Storage and Handling of Hazardous Substances Machinery Overhauls and Maintenance Execution of Works Management of Materials resulting from Excavations Washing of Concrete Mixers and Concrete Residues
<b>Water Resources</b>	Construction yard location and operation Water supply for the work Waste and wastewater management Storage and handling of hazardous substances Machinery overhauls and maintenance Washing of concrete mixers and concrete residues
<b>Air Quality &amp; Noise</b>	Execution of works Preservation of Air Quality and Noise Implementation of the Health and Safety Plan

<b>Waste</b>	<p>Construction yard location and operation</p> <p>Waste and wastewater Management</p> <p>Execution of works</p> <p>Management of Materials resulting from Excavations</p> <p>Washing of Concrete Mixers and Concrete Residues</p>
<b>Cultural heritage</b>	<p>Execution of works</p> <p>Discovery of archaeological remains</p>
<b>Employment and Working Conditions</b>	<p>Staff Training and Awareness</p> <p>Implementation of the grievance redress mechanism (maintaining its accessibility and dissemination to workers)</p> <p>Codes of Conduct (maintenance)</p>
<b>Occupational health and safety</b>	<p>Implementation of the Health and Safety Plan</p>
<b>Community health and safety</b>	<p>Execution of Works</p> <p>Fencing and Signaling of Works and Conditioning of Pedestrian and Car Circulation</p> <p>Fire Prevention</p> <p>Emergency Plan</p>
<b>Human rights</b>	<p>Staff Training and Awareness</p> <p>Implementation of the grievance redress mechanism (maintaining its accessibility and dissemination to communities)</p> <p>Codes of Conduct (maintenance)</p>

Table 5.2- Summary table of mitigation measures for the Completion of the construction phase

**Measures for the Completion of the Construction Phase:**

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>
<b>General</b>	Remediation of Intervened Areas

Table 5.3- Summary table of mitigation measures for the Operation phase

**Measures for the Operation Phase:**

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>
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<b>General</b>	Labor Recruitment Codes of Conduct Update of the ESMP and Health and Safety Plan Staff Training and Awareness
<b>Soils and Land Use</b>	Waste and wastewater Management Storage and Handling of Hazardous Substances
<b>Water Resources</b>	Efficient Use of Water Waste and Wastewater Management Storage and Handling of Hazardous Substances
<b>Risks and Impacts on:</b>	<b>Measures related to:</b>
<b>Waste</b>	Waste and wastewater Management
<b>Employment and Working Conditions</b>	Staff Training and Awareness Implementation of the grievance redress mechanism (maintaining its accessibility and dissemination to workers) Codes of Conduct (maintenance)
<b>Occupational health and safety</b>	Implementation of the Health and safety Plan Emergency Plan
<b>Community health and safety</b>	Facility Security Fire Prevention Emergency Plan
<b>Human rights</b>	Staff Training and Awareness Implementation of the grievance redress mechanism (maintaining its accessibility and dissemination to communities) Codes of Conduct (maintenance)

Table 5.4- Summary table of mitigation measures for the *Deactivation* phase

**Measures for the Deactivation Phase:**

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>
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<b>General</b>	The measures for the decommissioning phase will be, in essence and with the necessary adaptations, identical to those recommended for the construction phase.
<b>Labor</b>	Training of the personnel involved in the operation of the plant, to facilitate their reintegration into the labor market
<b>Waste</b>	Reuse or recycling of decommissioned materials and equipment

The ESMP describe the mitigating measures and how the monitoring should be carried out, with the intention of proportionalising the effort to be applied to this monitoring to the (limited) scale of risks and impacts anticipated for the Project.

## 6 Environmental and social management plan

### 6.1 Introduction

Environmental and social management is an essential tool for adopting the best and most appropriate practices for managing the risks and impacts of a project.

The present Environmental and Social Management Plan (ESMP) therefore intends to constitute itself as an instrument that frames and establishes the bases for monitoring the subproject corresponding to the photovoltaic park to be installed in the island of Maio, within the scope of Subcomponent 1.1 (“Integration of small-scale renewable energies”) of the Project “Renewable Energy Project and Improvement of Energy Efficiency in Public Services”.

This Environmental and Social Management Plan (ESMP) is thus intended to be an instrument that frames and establishes the bases for monitoring the implementation of the photovoltaic park, from even before the start of construction work to the operational period and finally to the decommissioning phase, in order to verify and control the most sensitive environmental factors and to guarantee the implementation of the recommended mitigation measures.

The ESMP is also a commitment to the interested and affected parties, with the rules and standards of good environmental and social management applicable through the implementation of the programmes recommended below.

It should be noted that it is intended that the environmental and social management has a dynamic and flexible nature, ensuring compliance with the guidelines now formulated and those that may result from future formal processes of environmental impact assessment, but allowing for its updating, reformulation and adaptation to the circumstances found in the following stages of the process. Thus, the present ESMP should be detailed and complemented by the EPC Contractor and, subsequently, by the

solar PV plant operator, demonstrating how the requirements now established will be implemented.

## 6.2 Scope and objectives

The ESMP applies to the pre-construction (planning and engineering project), construction and operation phases, and constitutes a document that structures the main guidelines for minimising risks and negative impacts and for maximising positive impacts, as well as the monitoring recommended for monitoring and controlling the effects of the projects.

The main objectives of this ESMP are the following:

- Be proportional to the significance of the environmental and social risks and impacts identified. As described above, no risks or impacts on the biophysical or socio-economic environment have been identified that might raise doubts about the sustainability of the development of the photovoltaic park, an aspect taken into account in the establishment of the guidelines contained in this ESMP;
- To ensure compliance with the applicable legal, regulatory or normative requirements;
- Assign responsibilities to the various entities involved in all phases of the project.
- Define a list of the mitigation measures to be adopted, in a hierarchy of mitigation, and the monitoring plans to be carried out.
- To define the bases for the procedures to be drawn up and adopted to ensure compliance with the measures for mitigating environmental risks and impacts.
- Promote the application of the best environmental and social practices.
- Promote the prevention of environmental and social risk situations.
- Define the records required for the environmental and social management of projects, particularly with regard to environmental monitoring of construction.
- Define the communication mechanisms (internal and external) deemed appropriate.

## 6.3 Table of responsibilities

The following distribution of direct responsibilities in the environmental and social management of the Project's implementation is assumed:

**Special Projects Management Unit (UGPE):**

UGPE, through a Project Implementation Unit and on behalf of the "Project Owner" (the Ministry of Industry, Trade and Energy), will establish from the outset the terms of reference to be followed for the environmental and social

management of the Project, taking into account the applicable legal requirements and the requirements of the entity financing the Project, and will ensure that these terms of reference are complied with.

The UGPE will oversee the obtaining of licenses and permits to carry out the Project, the formal articulation with the various official bodies involved in the process, and the implementation of the Grievance Redress Mechanism (GRM).

#### **“Owner's Engineer” (OE):**

The activities for which the OE will be responsible include assisting UGPE in the procurement of goods and services related to sub-component 1.1 of the project, controlling and supervising construction works, supporting the implementation of the training program, and supporting and monitoring the implementation of environmental and social safeguards. Under this specific aspect, the intervention will focus on the following aspects:

- Support the UGPE in the implementation of the training scheme associated with the implementation of the Project.
- Review and approve the plans and other documentation to be prepared by the Contractor in accordance with the provisions of this ESMP.
- Develop and put into practice a system for supervising the works covered by the Contractor, to verify the implementation of plans and safeguard measures and, in general, the performance in environmental and social matters of that contract.
- Prepare periodic reports for the UGPE on the environmental, social, health and safety management of the project.

#### **EPC Contractor (“Contractor”)**

The Contractor for the EPC (Engineering, Procurement and Construction) contract will be responsible for the detailed engineering studies, the supply of materials and equipment necessary for this, carrying out the construction work on the solar PV plant, the physical execution of the works, under the supervision of the Owner's Engineer (OE) and will thus be the main agent in the generation of environmental and social impacts during the construction phase. The Contractor will also be responsible for starting up the operation of the solar PV plant, as well as its maintenance for a period of 2 years.

The Contractor will have, in its organization, the necessary means to carry out these works and to manage the different areas involved, such as quality, hygiene, safety and environment, including an Environmental Specialist with demonstrated in Health and Safety management, as well as an experienced Social Specialist. These specialists will be present full-time at the construction sites.

#### **Operation and Maintenance Contractor (“Operator”)**

In an initial period, the Operation and Maintenance (O&M) of the solar PV Plant will be ensured by the Contractor and, subsequently, by an Operator to be selected through a tender to be launched for this purpose. Thus, the Operator

will be responsible for the long-term environmental and social management of the solar PV plant.

## **6.4 Environmental and Social risks and impacts**

The following paragraph presents a summary of the analysis of risks and impacts associated with the photovoltaic park in the Furna ZDER.

In the construction phase, construction site activities are likely to generate water contaminated with hydrocarbons, heavy metals, suspended solids and organic matter, which could cause soil contamination if measures are not taken to control these effluents by sending them to appropriate treatment or recovery systems, and to control the conditions of storage and use of hazardous substances and waste.

There will be negative impacts on air quality, both due to the construction process and movement of machinery, and due to the increase in vehicle traffic needed to transport materials and workers. The cleaning and regularization of the land, the digging of trenches and excavations for the foundations, as well as the circulation of vehicles on unpaved roads will give rise to the emission of particulate matter (dust).

Significant quantities of packaging waste (equipment packaging) are expected to be produced, with the assumption that a significant part may have reuse or recycling potential.

Temporary jobs will be created for civil construction, transport and equipment assembly activities. The significance of the impacts thus generated will necessarily depend on the number of jobs involved, the duration of the work and, from a geographical perspective, the proportion that can be secured locally or nationally.

The circulation of machinery and vehicles involved in the works will increase the likelihood of accidents. Without prejudice to the need to adopt appropriate prevention measures, it should be noted that the increase in traffic associated with the work will be modest and temporary and very slight compared to the traffic on the EN3-BR-01 road.

The negative risks and impacts analysed will not be significant and it is expected that the development of the ZDER will even provide some positive impacts, especially in terms of reducing dependence on fossil fuels for the production of electricity on the island of Brava, mitigating the emission of greenhouse gases and improving air quality.

## **6.5 Mitigating measures for the planning / pre-work phase**

## 6.5.1 Implementation of the Grievance Redress Mechanism (GRM)

UGPE has implemented the GRM, namely with the constitution of the Local Complaints Management Committees (LCMC), one in each municipality where the Project is developed, and the Central Complaints Management Committee (CCMC), and with the creation of the means and procedures necessary for the operation of the GRM.

Within the scope of the GRM, complaints are categorized as follows:

**Category A - Complaints related to the management and execution of the project:**

- Stakeholder participation and dissemination of information.
- Environmental and social risks and effects.
- Labor and working conditions.
- Rational use of resources and prevention of pollution.
- Community health and safety.
- Land acquisition, restrictions on land use and involuntary resettlement.
- Biodiversity conservation and management.
- Cultural heritage.
- Mobilization of partners and information/communication.

**Category B – Gender-Based Violence and Violence Against Children.**

**Category C – Project Performance.**

Any person or group of persons involved in the project, partner institutions, NGOs and community-based associations, local councils and any individual or group affected by the project can raise a grievance. Anonymous suggestions and complaints are accepted.

Suggestions and complaints can be submitted locally or centrally (UGPE), in several ways:

**By telephone (“Linha Verde”).**

**Email.**

**Specific form.**

**Community meetings.**

**Personally.**

The GRM contains provisions related to the reception and registration of complaints, their treatment, analysis and investigation, verification and subsequent actions and the follow-up, monitoring and reporting of the situations complained of, as well as the communication strategy to be adopted.

Before the start of works, the UGPE will promote the dissemination of the GRM among the different interested and affected parties, including the Project workers (see section on training and awareness of workers, below).

During the implementation phase of the Solar PV plant, the Contractor will ensure that the GRM will be easily accessible and that its existence will be disseminated among the direct and indirect workers at its service. The Contractor will have internal procedures to receive worker's grievances and liaise with the Project's GRM. Any grievances received by the Contractor must be reported to UGPE.

Responsibility: UGPE and Contractor

### 6.5.2 Codes of Conduct

The Contractor will try to subscribe and implement the Codes of Conduct for the Implementation of Environmental, Social, Health and Safety (ESHS) and Occupational Health and Safety (OHS) Standards, and prevention of Gender-Based Violence (GBV) and Violence Against Children (VAC) presented in **Erro! A origem da referência não foi encontrada.**

Company Code of Conduct: Commits the company to address GBV and VAC issues.

Manager's Code of Conduct: Commits managers to implement the Company's Code of Conduct, as well as those signed by individual workers.

Individual Code of Conduct: Code of Conduct for everyone working on the Project, including managers.

Responsibility: Contractor

### 6.5.3 Community Engagement

Conduct a public meeting in the municipality of Brava, in order to:

- Introduce the Contractor, who, in turn, will describe his work plan (activities to be carried out and respective expected start and end dates).
- Present environmental and social safeguards, with emphasis on GBV and VAC prevention measures, and disseminate the Project's GRM.
- DNICE UGPE should ensure that the terms of reference for the construction works include specific provisions for IPP to prepare a recruitment plan that is transparent to ensure that Brava residents are given priority in the selection process.
- Likewise, the Stakeholders Engagement Plan (SEP) and the Grievance Redress Mechanism (GRM) drawn up during the consultancy work carried out for the preparation of the safeguard instruments at the level of the ZDER should be made operational before construction starts.

- Specifically with regard to the GRM, this instrument defines the organizational structure necessary for its operationalization, foreseeing the creation of a Local Complaints Management Committee (composed, in each location, by the Municipality, which will coordinate, by the Delegation of the Ministry of Agriculture and Environment and/or the institution involved in the implementation of the Project, by a representative of Civil Society, to be chosen by the communities, by representatives of People Affected by the Project (PAP) and of vulnerable groups, including women and children) and a Central Complaints Committee. The GRM contains provisions regarding the reception and registration of complaints, their treatment, analysis and investigation, verification and subsequent actions and the follow-up, monitoring and reporting of the situations complained about, as well as the communication strategy to be adopted.

Responsibility: UGPE, with the support of the OE and participation of the Contractor

#### **6.5.4 Prevention of Forced Labor**

The risk of using forced labor by polysilicon suppliers is known, so it will have to be demonstrated that the suppliers of solar PV panels for the project do not use forced labor and child labor among their workforces. Thus, the Contractor will have to submit two declarations: a Forced Labor Performance Declaration (which covers past performance) and a Forced Labor Declaration (which covers future commitments to prevent, monitor and report on any forced labor, also applicable to their own subcontractors and suppliers).

Responsibility: Contractor

#### **6.5.5 Liaison with other entities**

- Close cooperation must be maintained, right from the planning and design phase and during construction, with the town council, ENAPOR, Estradas de Cabo Verde and the operators of linear infrastructure (such as water distribution, energy or telecommunications) that may be affected by the project or affect its execution. Special attention should be paid to interventions in areas of recent works that may be in a period of guaranteed good execution. The connection of the photovoltaic park to the public electricity grid should, naturally, deserve the greatest attention.
- The procedures to be followed in the event of accidental (unforeseen) damage to any such infrastructure should also be set out.

- In coordination with the Municipal Council, among other possible issues, it will be necessary to ensure the removal of solid waste deposited in areas that could interfere with the proper and safe execution of the works.

Responsibility: Contractor, with supervision of the UGPE and the OE

### **6.5.6 Routing the grid connection line**

- When developing the engineering design of the line to connect the photovoltaic park to the electricity grid, the cables should be laid in trenches along (at the edge) of existing roads or paths, avoiding interference with any buildings and other existing infrastructures and the affectation of areas not previously artificially built.

Responsibility: Contractor, with supervision of the UGPE and the OE

### **6.5.7 Labor Management**

A LMP, including Labor Management Procedures has been prepared for the Project<sup>1</sup>. The Contractor must take in consideration the requirements set in the LMP when preparing the CESMP.

Among other aspects, the Contractor must prepare a recruitment plan that is transparent in order to guarantee that the community in the area of direct influence has priority in the selection process, whenever this is compatible with the needs of the contract.

The recruitment process should also be equitable in terms of gender, with the aim of boosting the recruitment of women.

All staff recruited (directly by the Contractor or its subcontractors) must sign the code of conduct relating to GBV and VAC and will be subject to specific awareness rising on these matters.

Responsibility: Contractor

### **6.5.8 Completion and Detailing of the Environmental and Social Management Plan**

As part of the preparation of the work, the Contractor will complete and detail the general requirements established in this ESMP, depending on the specificities of its organization and the human and material resources that will be assigned to the work.

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<sup>1</sup> Downloadable from: [https://www.mf.gov.cv/documents/20126/0/02\\_PGM-Projecto+do+Servic%CC%A7o+de+Eletricidade+Sustenta%CC%81vel.docx/e6826cca-c548-074d-c9e8-d20588794fd9?t=1620993310677](https://www.mf.gov.cv/documents/20126/0/02_PGM-Projecto+do+Servic%CC%A7o+de+Eletricidade+Sustenta%CC%81vel.docx/e6826cca-c548-074d-c9e8-d20588794fd9?t=1620993310677)

The revised ESMP will be submitted for approval by the UGPE (assisted by the OE) before the start of work. Once approved, the revised document will become the Contractor's ESMP (CESMP).

Responsibility: Contractor

### 6.5.9 Health and Safety Plan

The Contractor will prepare a Health and Safety Plan (HSP) that responds to the requirements established in Decree 64/2010. Thus, the HSP should include an identification of hazards and risk assessment and the definition of preventive measures to be adopted, considering the following aspects:

The types of work to be carried out, with emphasis on those with special risks (e.g., electrical) and the respective phasing.

The specificities of the places where the work is carried out and the infrastructure and activities found there.

The construction processes, materials, and products to be used.

Specifically in relation to the prevention of Covid-19, the following aspects should be ensured right from the planning stage:

Strict compliance with the determinations of the national health authorities and the follow-up of the guidelines of international institutions

Creation, implementation of verification of the effectiveness of procedures related to<sup>2</sup>:

- Assessment of workforce characteristics.
- Transport, entry and exit from the workplace and checks before starting work.
- General hygiene care.
- Cleaning and waste management.
- Adjustments in work practices.
- Health care on site and available on the island.
- Procedure in case of identification of a positive case of infection.
- Continuity of supplies and Project activities.
- Training and communication with workers.
- Communication and contact with the community.

At least one qualified first aider must be present at all times and appropriately equipped first-aid stations must be easily accessible on site. All the personnel must be aware of the actions to be taken in an emergency.

Where hazardous substances are stored and/or handled, there must be means (absorbent products - sand or sawdust - utensils and containers to collect spilled products), which allow for quick action in the event of a spill, to reduce the amount of

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<sup>2</sup>To prepare these procedures, consider, in addition to articulating with national health authorities, the specific guidelines of the World Bank: "ESF/Safeguards Interim Note: Covid-19 Considerations in Construction / Civil Works Projects" (Version 1, of 7 April 2020 or a more recent one that becomes available in the meantime).

spilled product and the extent of the affected area. Personnel working in these locations must have specific training on what to do in the event of a spill.

Where flammable substances are stored and/or handled, means of first intervention in the event of fire must be available (at least fire extinguishers of the appropriate class for the type of substances in question) and the staff must have specific training for their use.

During the entire duration of the construction work, the Contractor must ensure the capacity to respond promptly, even outside normal working hours and on weekends and holidays, to any accident or emergency related to the work (on the construction site or on any of the work fronts), and for this purpose keep personnel in a state of readiness and in conditions to be contacted.

This procedure should provide for articulation with local civil protection and fire services and security forces (National Police), to:

- Ensure that these local services are familiarized with the specificities of the actions and infrastructure related to the solar PV plant; and
- Confirm the exact ways in which those local services and/or the National Police can be alerted and mobilized to respond to an emergency (use of the national emergency number – 112 – or another mechanism to be indicated).

The HSP and the detailed procedure to be adopted in case of emergency must be prepared by the Contractor and be submitted for approval by the UGPE (assisted by the OE) before the start of the works. This procedure must reflect the specificities of the organization and of the human and material resources that will be assigned to the contract.

Once approved, the revised document will become the Contractor's HSP (CHSP).

Responsibility: Contractor

### **6.5.10 Covid-19 Prevention**

The terms of reference for contractor should include the following:

- Strict compliance with the determinations of national health authorities and following the guidelines of international institutions;
- Creation, implementation and verification of the effectiveness of procedures relating to <sup>3</sup>:
  - o Assessment of workforce characteristics;

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<sup>3</sup> For the preparation of these procedures, consider, in addition to the articulation with national health authorities, the specific guidelines of the World Bank: "ESF/Safeguards Interim Note: Covid-19 Considerations in Construction / Civil Works Projects" (Version 1, of 7 April 2020 or other more recent that is made available in the meantime).

- Transport, entry and exit from the workplace and checks before starting work; ○ General hygiene care; ○ Cleaning and waste management; ○ Adjustments in working practices; ○ Health care on site and available on the island; ○ Procedure in case of identification of a positive case of infection; ○ Continuity of supplies and project activities; ○ Training and communication with workers;
- Communication and contact with the community.

Responsibility: UGPE

### **6.5.11 Prevention and mitigation of risks linked to GBV and VAC**

- The terms of reference for the contractor should include specific provisions on genderbased violence (GBV) and violence against children (VAC).
- Stakeholders should therefore commit to creating and maintaining an environment in which GBV and VAC have no place and where they are absolutely not tolerated by any employee, subcontractor, supplier, partner or company representative.
  - The elaboration and application of the Code of Conduct and Action Plan for the implementation of the ESHS/ASHS and OHS standards for the prevention of Gender Based Violence and Violence against Children is compulsory, taking into account that it is necessary to ensure that the entire project team is aware of the values in question, the expectations of all workers and recognise the consequences of violations of those values, in order to ensure a more harmonious, respectful and productive implementation, guaranteeing the achievement of the project's objectives.
- Globally, companies should commit to treat women, children and men with due respect regardless of race, colour, language, religion, political or other opinion, national or local origin, ethnicity, property, disability, or other related status. Any forms of GBV or VAC are considered acts of violation of this commitment.
- Companies shall also ensure that interactions with members of local communities are respectful and non-discriminatory, and that humiliating, threatening, offensive, abusive, culturally inappropriate or disrespectful language and/or behaviour is prohibited for all employees, partners and company representatives, including subcontractors and suppliers.

- Due consideration should be given to the fact that acts of GBV or VAC constitute serious misconduct and are therefore grounds for misdemeanours, which may include sanctions and/or termination of employment contracts as well as possible referral to the national police for further investigation and other legal measures.
- All forms of GBV or VAC, including harassment, are unacceptable, whether on construction sites, on intervention areas or in local communities.
- Sexual contact or activity involving children under the age of 18, including through the use of new information technologies, is prohibited and punishable under existing national law. The allegation of erroneous information about the age of a given child shall not constitute a defence. Similarly the allegation of consent of the child shall not be considered grounds or arguments for excuse, exculpation or defence.
- Unless of the consent of the parties involved, sexual interactions between company employees (at all levels) and members of the communities near the workplace are prohibited.
- Includes relationships involving the promise/giving of an actual benefit (monetary or non-monetary) to community members in exchange for sexual favours/benefits.
- In addition to specific sanctions imposed on companies, legal action will be taken against individuals who commit any acts of GBV or VAC.
- Employees and workers, as well as volunteers and contractors, are strongly encouraged to report occurring or alleged acts of GBV and/or VAC committed by a colleague, from the same or different companies. The corresponding reports shall be made in accordance with the internal procedures for GBV and VAC complaints.
- Managers are obliged to report and take appropriate countermeasures against alleged or occurring acts of GBV and/or VAC, in their capacity as responsible for compliance with the commitments made by the company and the engagement of their direct subordinates.
- It is recommended that the project management team designate a "focal point" to address GBV and CHV issues and ensure that an effective GBV and CHV action plan is developed and implemented.
- Preventive measures may include, for example, awareness-raising activities and mandatory training of staff on national and international legislation, on harassment and sexual violence against women, and the exploitation of children (UN resolution 48/104 on the Declaration on the Elimination of Violence against Women, resolution 2011/33 on prevention, protection and international

cooperation against the use of new information technologies to abuse and/or exploit children, resolution 44/25 of 20 November 1989 on the rights of the child, etc.).

- These provisions should also specify the mechanism to be set up by the contractor to identify, address and report cases of harassment, sexual abuse and violence on women and child exploitation at worksites.
- The tender documents should require the implementation of internal regulations geared towards raising awareness among workers. Contractors working will make available, in a visible and accessible manner, an internal regulation on site, specifying: respect for local habits and customs; protection against sexually transmitted diseases (STD/HIV/AIDS); hygiene standards; and safety measures. Contractors must also raise their staff's awareness, particularly with regard to respect for the customs and traditions of the local people and the risks linked to STDs and HIV/AIDS.

Responsibility:UGPE

## **6.6 Measures for the construction phase**

### **6.6.1 Preparing the work**

#### **6.6.1.1 Covid-19 Prevention**

- Implement and keep up to date the procedures established at the planning stage.

Responsibility: contractors

#### **6.6.1.2 Relations with populations**

- Construction works shall be accompanied by the operationalisation of the Stakeholder Engagement Plan (SEP) and the Grievance Redress Mechanism (GRM) in accordance with the guidelines established at the planning stage.

- The measures envisaged for the prevention and mitigation of GBV and VAC risks will be implemented as planned, covering Contractors' personnel, subcontractors and suppliers.

Responsibility: contractors

#### **6.6.1.3 Liaison with other entities**

- During the construction phase, the Contractors must continue the liaison with other entities initiated during the planning and design phase.
- In this context, the first step will consist of updating and detailing the general planning of diversions or other interferences with various infrastructures (water, electricity or telecommunications, in particular).

- Whenever any period of unavailability of any infrastructure is forecast, coordination with the entity responsible for that infrastructure must be guaranteed, so that the affected populations are warned in advance by the most appropriate means in order to ensure that they are effectively aware of that unavailability, as well as of the measures planned to minimise the resulting inconvenience.
- In any case in which any infrastructure is affected as a result of the implementation of the Project, the repositioning of that infrastructure must be carried out in such a way as to restore, at least, the service conditions previously existing and, desirably, to improve them, even if, for this purpose, it is necessary to settle accounts with the entity responsible for that infrastructure.

Responsibility: contractors

#### **6.6.1.4 Drawing up of detailed procedures for action**

- As part of the preparation of the work, the Contractors shall detail the procedures to be adopted (particularly for emergency response and in the event of the discovery of archaeological remains), in accordance with the general requirements established in the present ESMP.
- In the detailing of such procedures (which shall be submitted for approval by the supervision before work begins) the Contractor shall integrate and reflect the specificities of its organisation and of the human and material resources that will be assigned to the work.

Responsibility: contractors

#### **6.6.1.5 Elaboration and implementation of a Grievance Mechanism for Workers**

- The Contractors shall prepare and submit to the Supervision for approval a Grievance Mechanism for workers. Through this mechanism, workers will be able to raise their concerns at the workplace, including issues relating to unsafe or unhealthy work situations;
- Workers will be informed about this tool at the time of hiring and about the measures put in place to protect them against any reprisal for its use. It must be possible for workers to submit issues anonymously and/or to a person other than their direct line manager. In no case may workers suffer any form of retaliation as a result of any complaint made;
- This tool should be accessible to all direct and subcontracted workers, taking into account their different characteristics, for example female workers, migrant workers or workers with disabilities;
- This mechanism should operate in an objective, independent and transparent manner, providing timely feedback to the workers who use it;

- The operation of the mechanism shall generate records that can be verified by the Inspection or the Environmental and Social Consultant;

Responsibility: contractors

#### **6.6.1.6 Labour recruitment**

- When recruiting staff for the construction work, preference should be given to the use of local labour, whenever compatible with the needs of the proper execution of the work.
- All staff recruited will be required to sign the code of conduct on GBV and VAC and will be made specifically aware of these issues (see next section).

Responsibility: contractors.

#### **6.6.1.7 Staff training and awareness-raising**

At the beginning of the work, training and awareness-raising activities should be carried out for the construction crews, with a view to improving their knowledge about how to prevent or minimise the environmental effects of their activities and to promote better relations with local populations. Before the start of the work, the UGPE will promote, with the support of the OE and other entities, namely ICIEG - Cabo Verdean Institute for Gender Equality and Equity, the training of the Contractor's management team, the environment, health and safety and social specialists, and work supervisor(s), covering the following topics:

- Environmental effects that the work may cause and the corresponding good practices and preventive and corrective measures to be adopted;
  - Rules and procedures for waste management on site;
  - Safety risks associated with construction work and the corresponding preventive measures and behaviour to adopt;
  - First aid and action in the event of an accident;
  - General standards of relationship with local populations;
  - Awareness raising on GBV and VAC issues (see specific guidelines);
  - Risks and prevention of sexually transmitted diseases;
  - Measures to be taken in the event of the discovery of archaeological remains;
  - Complaints management mechanism for workers and its use.
- Subsequently, the Contractor's management team must ensure the provision of training and awareness actions aimed at all on-site staff at its service

(including the staff of its subcontractors), in order to improve their knowledge of the actions they must take in order to prevent or minimize the environmental effects of its activity and to promote better relations with local populations. The presence and content of these actions must be duly registered.

- Whenever new workers are taken on, they should be given the same training and awareness-raising.
- During the course of the work and following the follow-up and monitoring activities, the need for additional training and awareness-raising activities may be determined if it is found that the previous actions have not produced the desired effects.

Responsibility: UGPE, with support from OE and ICIEG, and Contractor.

### **6.6.1.8 Waste management**

- Before starting the work, Contractors must establish the necessary agreements / contracts to ensure the proper management of waste produced during construction, in strict compliance with applicable legal provisions and good practices to prevent environmental and social risks and impacts associated with the improper disposal of such waste.

Responsibility: contractors

### **6.6.1.9 Exploitation of borrow sites to obtain aggregates**

- Priority should be given to obtaining inert materials (sand, in particular) for the project from existing quarries, instead of resorting to quarries started up on purpose for the project.
- In the case of existing holdings, the use of aggregates from unlicensed holdings will be prohibited (i.e. the holdings must be shown to have been licensed).

Responsibility: contractors

## **6.6.2 Location and operation of the yard and park area**

### **6.6.2.1 Location**

- The construction site and materials yard should be located inside the perimeter of the photovoltaic park, preferably in areas where vegetation destruction and relevant earthworks are necessary.

Responsibility: contractors.

### **6.6.2.2 Security and access control**

- The construction site and the entire perimeter of the photovoltaic park should be fenced off and access controlled so as to prevent outsiders from entering, with a guard service maintained throughout the construction period (until the site is decommissioned).

Responsibility: contractors.

### **6.6.2.3 Water supply for the works**

- The water supply for the project will have to be provided primarily from the existing public systems.
- If water sources other than public systems are required, the Contractor shall ensure that they are licensed water sources and that no harm or limitations to local people will result from their use.
- The re-use of treated wastewater for irrigation (dust suppression or landfill) should be promoted if public systems have the capacity to supply sufficient quantities of such water and if the quality of the water is guaranteed to be compatible with such uses (i.e. if the re-use is not likely to cause a health risk for workers or the population).
- The use to be made of water from different sources must be compatible with its respective qualities.
- Particular attention should be paid to the supply of water that is guaranteed to be drinkable in sufficient quantity to meet the needs of workers while on duty.

Responsibility: contractors.

### **6.6.2.4 Waste and wastewater management**

- The site must have adequate sanitary facilities for the number of workers.
- Waste water from sanitary facilities and any other contaminated waste water from other areas of the site must be drained and, if necessary, subjected to appropriate treatment for the type of contamination they present, prior to discharge into the receiving environment. At the very least, waste water from the sanitary facilities should be routed into a septic tank (which should remain in place to serve the facilities during the operational phase).
- The discharge of wastewater is subject to licensing under the legal terms (Water and Sanitation Code, Legislative Decree 3/2015).
- The site should have appropriate technical conditions for the storage of the various types of waste pending their transport for recycling, treatment or disposal.
- The different types of waste, which should be properly marked, should not be mixed and should not be exposed to weather conditions that might cause them to degrade or result in soil, water or air contamination.
- Waste from the work shall be stored separately in appropriate containers until it is removed for recycling, treatment or disposal by properly licensed/authorised operators.

- Any transportation of waste generated at the site must obey the legal requirements concerning the accompanying documents for such waste.

Responsibility: contractors.

#### **6.6.2.5 Storage and handling of hazardous substances**

- The storage and handling of oils, lubricants or other substances likely to cause contamination of the soil and of surface or underground water must be carried out in specially adapted locations, in order to safeguard environmental values and human health.
- As a minimum, if oils and fuels are to be handled, sealed and limited areas must be provided to contain any spillage.

Responsibility: contractors.

#### **6.6.2.6 Reviews and maintenance of machinery**

- Servicing and maintenance of the machinery should not be carried out in the workplace, but in properly prepared workshops.
- In cases where this type of intervention is necessary in the workplace, the necessary care must be taken to prevent soil and water contamination and to collect the resulting waste, which should subsequently be sent for recycling, treatment or disposal.

Responsibility: contractors.

### **6.6.3 Execution of the works**

#### **6.6.3.1 Fencing and signposting of the works and conditioning of pedestrian and car circulation**

- If any work is to take place outside the perimeter of the photovoltaic park, namely for the transportation of parts and equipment, it is necessary to ensure that work areas are marked off at all times, restricting the circulation of people, machinery and equipment to the defined accesses and limiting the actions of the construction process to the areas of intervention, thus avoiding the use of areas that are not strictly necessary for the proper execution of the work.
- No excavation outside the perimeter of the photovoltaic park may be left open at night or on days (particularly weekends or public holidays) when work is stopped without adequate signposting and protection. The signposting and protection conditions will be suitable for both motorised traffic and pedestrians.

Responsibility: contractors.

#### **6.6.3.2 Management of materials resulting from excavations**

- Uncontaminated soil from excavation operations should be reused for backfilling trenches or foundations. Any residual quantities that cannot be reused

constitute waste and should be sent for appropriate final disposal, and their indiscriminate spreading in places where it may cause damage is forbidden.

- In the case of soil that has been contaminated by some accidental action, it must be deposited in a sanitary landfill, without prejudice to the adoption of a treatment solution (e.g. in biopiles, in the case of hydrocarbon contamination) which, if applicable, must be given priority.

Responsibility: contractors.

### **6.6.3.3 Washing of concrete mixers and concrete waste**

- Concrete mixer washing water and concrete waste that may be produced by the works should not be thrown into the soil, but collected and conditioned for controlled disposal at sites where it cannot cause environmental damage.

Responsibility: contractors.

### **6.6.3.4 Preservation of air quality and noise reduction**

- All equipment, machinery and vehicles used in the construction work with combustion engines must be in good working order so as to limit the undesirable emission of atmospheric pollutants and noise.
- Whenever machinery and vehicles circulate on unpaved roads or when earth is being moved, and dust that may disturb or cause damage is generated as a result, these roads or work fronts shall be watered to reduce the dust. When carrying out this watering, preference should be given to the use of non-potable water (see section on water supply for the site).
- The open air burning of any kind of urban, industrial and toxic or dangerous waste, as well as all kinds of material commonly known as scrap metal is forbidden (art. 40 of Decree-Law no. 5/2003).

Responsibility: contractors.

### **6.6.3.5 Fire prevention**

- Hot works (namely cutting and welding works), as well as any operation or activity involving open fires should not be allowed in places where there is combustible material (namely dry vegetation) that could increase the risk of fire.
- Any work or activities involving a fire hazard must be preceded by the cleaning of the pasture or undergrowth, and must be carried out in the presence of firefighting equipment that can be immediately mobilised, namely chemical powder (ABC) extinguishers.

Responsibility: contractors.

### 6.6.3.6 Emergency response

- The building sites should have first aid resources (human and material) appropriate to the risks involved and the number of workers involved, and the staff should be aware of the actions to be taken in the event of an emergency.
- In places where dangerous substances are stored and/or handled, means (absorbent products - sand or sawdust - utensils and containers for collecting spilled products) should be available to enable swift action to be taken if a spillage occurs, so as to reduce the quantity of product spilled and the extent of the area affected. The personnel working in these areas should be specifically trained in the action to be taken in the event of a spillage.
- In places where flammable substances are stored and/or handled, there should be means of first intervention in case of fire (at least extinguishers of a class appropriate to the type of substances in question) and the staff should be specifically trained in their use.
- Throughout the duration of the construction work, the contractor must ensure that it is able to respond promptly, even outside normal working hours and at weekends and on public holidays, to any accident or emergency situation related to the work (on site or at any of the work fronts), and to this end must keep staff on standby and ready to be contacted.
- The detailed procedure to be adopted in case of emergency must be prepared by the Contractors and be submitted to the Supervisory Board for approval before work begins. This procedure must reflect the specific features of the organisation and the human and material resources that will be assigned to the contract.
- This procedure should provide for articulation with local civil protection and fire services and security forces (National Police), in order to:
  - ensure the familiarisation of these local services with the specificities of the actions and infrastructures related to the photovoltaic park; and
  - confirm the exact arrangements under which those local services and/or the National Police can be alerted and mobilised to respond to an emergency (use of the national emergency number - 112 - or other mechanism to be indicated).

Responsibility: contractors.

### 6.6.3.7 Discovery of archaeological remains

- Site management staff and staff directly involved in the (limited) earthworks to be carried out as part of the construction of the photovoltaic park will receive specific training on the action to be taken if any archaeological remains are discovered during the course of these works;

- In the event of the discovery of archaeological remains, work should immediately be interrupted and the foreman of the work front should be immediately notified so that the following actions may be taken;
- Thus, the discovery area and its immediate surroundings should be immediately fenced off, with work and the presence of personnel forbidden inside and any finds duly protected and photographed without being removed from the site;
  - The works management will communicate with the OE, and this will be responsible for communicating the occurrence to the UGPE which, in turn, will inform the Environmental and Social Consultant and the World Bank.
  - The UGPE will also, under the terms of paragraph 1 of article 39 of Law 85/IX/2020, inform "Immediate knowledge to the local authority, which, in turn, must inform the Ministry of guardianship in order to take the necessary steps".
- According to paragraph 2 of the aforementioned article, *"The local authority must ensure the safeguarding of these testimonies, namely by resorting to scientific entities of recognised competence to carry out studies without prejudice to the immediate communication to the supervising Ministry"*.
- Work shall not resume in the isolated area without authorisation from the local authority, transmitted to UGPE, who shall instruct the Contractor and Supervision accordingly.
- Any changes or details of these requirements shall be the subject of a procedure to be drawn up by the Contractor, to be submitted for approval by the Monitoring Authority.

Responsibility: Contractors, OE and UGPE.

## 6.6.4 Conclusion of work

### 6.6.4.1 Replacement of intervened areas

After the installation of infrastructures and the vacating of the construction site, the intervened areas that are not occupied by the photovoltaic park must be promptly recovered in order to restore them to their previous state, unless future uses that benefit from the maintenance of the existing conditions are planned and proven.

Responsibility: contractors.

## 6.7 Measures for the operational phase

### 6.7.1 Preparation

#### 6.7.1.1 Preparation of supporting documents and procedures

- Prior to the start of the operation, supporting documents and procedures must be prepared, namely
  - Covid-19 prevention (if the pandemic situation still prevails at the time);
  - Relationship with populations;
  - Liaison with other entities;
  - Emergency response;
  - Waste management;
  - Mechanism for managing workers' complaints;
  - Labour recruitment.
- For this purpose, the requirements previously presented for the construction phase (section 6.6.1) apply, with due adaptations to the specificities of the operation.

Responsibility: Contractor/Operator

#### 6.7.1.2 Staff training

- The personnel who will work in the photovoltaic park's exploration should be trained in order to improve their knowledge about the actions they should take to prevent or minimize the environmental effects of their activity. This training should have the attendance and contents duly registered, and should cover, at least, the following subjects:
  - Environmental effects that the work may cause and the corresponding good practices and preventive and corrective measures to be adopted;
  - Rules and procedures for the management of waste produced at the photovoltaic park;
  - Safety risks associated with the installations and the corresponding preventive measures and behaviour to adopt;
  - First aid and action in the event of an accident;

- General standards of relationship with local populations; • Awareness raising on GBV and VAC issues (see specific guidelines);
  - Mechanism for managing workers' complaints.
- Whenever new workers are taken on, they should be given the same training and awareness-raising.
  - During the course of the operation it may be determined that further training and awareness-raising activities are necessary if it is found that previous activities have not had the desired effect.
  - During the operational phase, measures to prevent and mitigate the risks of GBV and VAC continue to apply.

Responsibility: Operator

### 6.7.2 Security of installations

- The photovoltaic park should be fenced off and access controlled, so as to prevent strangers from entering the site, and a guard service should be maintained with physical or electronic presence, as deemed appropriate.
- The security services to be provided shall be guided by the principles of proportionality and good practice and shall comply with applicable law in relation to the hiring, standards of conduct, training, provision of equipment, and monitoring of such security teams. The use of force shall not be acceptable in the course of providing security services, except when such use of force is used for preventive and defensive purposes, proportionate to the nature and extent of the threat.

Responsibility: Operator.

### 6.7.3 Waste and wastewater management

- The photovoltaic park should have adequate sanitary facilities for the number of workers.
- Waste water generated in sanitary facilities and any other contaminated waste water must be drained and, if necessary, subjected to appropriate treatment for the type of contamination it presents, before being discharged into the receiving environment.

- The park must be equipped with appropriate technical conditions for the storage of the various types of waste pending their transport for recycling, treatment or disposal.
- The different types of waste, which should be properly marked, should not be mixed and should not be exposed to weather conditions that might cause them to degrade or result in soil, water or air contamination.
- The waste should be placed, separately, in appropriate containers until it is removed to be subject to recycling, treatment or disposal by properly licensed/authorised operators.
- Any transportation of waste generated in the photovoltaic park must comply with the legal requirements concerning the accompanying documents for such waste.
- The above provisions on waste management also apply in cases where any infrastructure or equipment installed in the photovoltaic park is decommissioned:
  - Any waste produced as part of the decommissioning of the park (in whole or in part) must not be mixed and must not be exposed to weather conditions that could cause it to degrade or result in the contamination of soil, water or air.
  - Such waste must be stored separately in appropriate containers until it is removed to be subject to recycling, treatment or disposal by properly licensed/authorised operators.
  - Given the high potential for recovery (reuse or recycling) of various components (such as metallic structures and electric cables), the management of materials resulting from the decommissioning of the park must be carried out in such a way as to maximise this recovery, namely through careful segregation of the different types of materials and, when applicable, prevention of damage to equipment that can be reused in its current state.
  - Another particular call for attention should be made to the removal of transformers, especially if they are oil-cooled: ideally such transformers should be removed from the site without removing the respective cooling oils; if such removal has to be done, it can only take place in a properly prepared, watertight area and where the collection of oils in watertight containers is ensured, which should be sent abroad for treatment or final disposal.

Responsibility: Operator

#### 6.7.4 Storage and handling of hazardous substances

- The storage and handling of oils, lubricants or other substances likely to cause contamination of surface or underground water and soils must be carried out in specially adapted locations, in order to safeguard environmental values and human health.
- As a minimum, if oils and fuels are to be handled, sealed and limited areas must be provided to contain any spillage.

Responsibility: Operator.

#### 6.7.5 Emergency planning

- The photovoltaic park must have an emergency plan, in which measures and protocols for action are systematised to allow a prompt response to possible emergency situations, in order to mitigate potentially resulting environmental and social damage.
- Such planning should consider the risks of:
  - Natural disasters (earthquakes, extreme atmospheric phenomena);
  - Acts of vandalism or sabotage;
  - Accidents or fire in areas adjacent to the park or associated transmission line;
- The emergency plan should provide for at least:
  - The protection and prevention measures to be adopted;
  - The communication protocols to be adopted to alert and mobilise the civil protection and fire services and/or the security forces to respond to an emergency (use of the national emergency number - 112 - or other mechanism to be indicated).
  - Procedures for resuming the operation;
  - Protocols for information disclosure.
- This plan should also provide for coordination with local civil protection and fire services to ensure that these services are familiar with the specifics of the actions and infrastructures related to the photovoltaic park.

Responsibility: Operator.

### 6.7.6 Fire prevention

- A fuel management strip with a minimum width of 50 m should be maintained around the perimeter of the PV plant. Within this strip, tree tops should be spaced at least 4 metres apart, lower halves of trees should be pruned and undergrowth should be kept clear.
- Hot works (namely cutting and welding works), as well as any operation or activity involving open fires should not be allowed in places where there is combustible material (namely dry vegetation) that could increase the risk of fire.
- Any work or activities involving a fire hazard must be preceded by the cleaning of the pasture or undergrowth and must be carried out in the presence of immediately available fire fighting equipment, namely portable fire extinguishers of an appropriate class.

Responsibility: Operator.

### 6.7.7 Emergency response

- The photovoltaic park should have first aid resources (human and material) appropriate to the risks involved and the number of workers involved, and the staff should be aware of the actions to be taken in the event of an emergency.
- In places where dangerous substances are stored and/or handled, means (absorbent products - sand or sawdust - utensils and containers for collecting spilled products) should be available to enable swift action to be taken if a spillage occurs, so as to reduce the quantity of product spilled and the extent of the area affected. The personnel working in these areas should be specifically trained in the action to be taken in the event of a spillage.
- In places where flammable substances are stored and/or handled, there should be means of first intervention in case of fire (at least extinguishers of a class appropriate to the type of substances in question) and the staff should be specifically trained in their use.
- There must always be the capacity to respond promptly, even outside normal working hours and at weekends and holidays, to any accident or emergency situation related to the photovoltaic park, and to this end, staff must be on standby and ready to be contacted.

Responsibility: Operator.

## 6.8 Measures for the decommissioning phase

The environmental and social management measures to be applied in the decommissioning phase will be essentially identical to those recommended for the construction phase.

However, given that the decommissioning of the photovoltaic park will take place over a long time horizon (20 years?), it will be important to ensure that the measures to be adopted at that time are appropriate in view:

- to the legal requirements in force;
- best practices and available technical solutions (e.g. for the recovery of decommissioned materials); and
- any plans then in place for the future use of the PV park area.

Thus, prior to the start of work at this stage, a plan for decommissioning the photovoltaic park will need to be drawn up, detailing the actions planned and the measures to be taken concerning at least the following aspects:

- Relationship with populations and local entities;
- Recruitment and training and awareness raising of staff;
- Site location and site environmental protection measures to be followed during decommissioning work;
- Health and safety measures for workers and local communities;
- Waste management plan, including a plan for the recovery (recycling or reuse) of materials and equipment to be removed from the photovoltaic park, in a circular economy logic;
- Rehabilitation and biophysical enhancement of the photovoltaic park area (including access roads), taking into account the plans for future use of that area and its surroundings;

Responsibility: Operator (with the approval of the entity representing the State of Cape Verde in its relationship with the Operator).

## 6.9 Summary of mitigating measures

### Mitigating measures for the planning / pre-work

Risks and Impacts on:	Measures related to:	Responsibility
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Pre-work phase	GRM implementation	UGPE and Contractor
	Codes of conduct	Contractor
	Community Engagement	UGPE, with the support of the OE and participation of the Contractor
	Prevention of Forced Labor	Contractor
	Liaison with other entities	Contractor, with supervision of the UGPE and the OE
	Routing the grid connection line	Contractor with supervision of the UGPE and the OE
	Labor Management	Contractor
	Completion and Detailing of the Environmental and Social Management Plan	Contractor
	Health and Safety Plan	Contractor
	Covid-19 Prevention	UGPE
Prevention and mitigation of risks linked to GBV and VAC	UGPE	

#### Measures for the construction phase

Risks and Impacts on:	Measures related to:	Responsibility
Preparing the work	Staff training and awareness in Covid-19 Prevention	Contractor
	Relations with populations	Contractor
	Liaison with other entities	Contractor
	Drawing up of detailed procedures for action	Contractor
	Elaboration and implementation of a Grievance Mechanism for Workers	Contractor
	Labour recruitment	Contractor

	Staff training and awareness-raising	UGPE, with support from OE and ICIEG, and Contractor.
	Waste management	Contractors
	Exploitation of borrow sites to obtain aggregates	Contractors
Location and operation of the yard and park area	Site boundaries	Contractors
	Security and access control	Contractors
	Water supply for the works	Contractors
	Waste and wastewater management	Contractors
	Storage and handling of hazardous substances	Contractors
	Reviews and maintenance of machinery	Contractors
Execution of the works	Fencing and signposting of the works and conditioning of pedestrian and car circulation	Contractors.
	Management of materials resulting from excavations	Contractors.
	Washing of concrete mixers and concrete waste	Contractors.
	Preservation of air quality and noise reduction	Contractors.
	Fire prevention	Contractors.
	Emergency response	Contractors.
	Discovery of archaeological remains	Contractors, OE and UGPE.
Conclusion of work	Replacement of intervened areas	Contractors.

### Measures for the operational phase

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>	<b>Responsibility</b>
Preparation	Preparation of supporting documents and procedures	Contractor/Operator
	Staff training	Operator
Operational	Security of installations	Operator
	Waste and wastewater management	Operator
	Storage and handling of hazardous substances	Operator
	Emergency planning	Operator
	Fire prevention	Operator.
	Emergency response	Operator

#### **Measures for the decommissioning phase**

<b>Risks and Impacts on:</b>	<b>Measures related to:</b>	<b>Responsibility</b>
decommissioning of the photovoltaic	Drawn up and implement a plan for decommissioning the photovoltaic park	Operator (with the approval of the entity representing the State of Cape Verde)

## **6.9 Environmental and social monitoring**

The analysis of environmental and social risks and impacts carried out did not lead to the identification of the need to implement complex monitoring plans for any specific environmental or social component.

However, it will be necessary to monitor the implementation of the recommended environmental and social management measures and to verify whether these measures produce the expected results.

The following sections describe how this monitoring should be carried out, with the intention of proportionalising the effort to be applied to this monitoring to the (limited) scale of risks and impacts anticipated for the Project.

### 6.9.1 Actions by the actors (Responsibilities)

The responsibilities for the implementation of each of the mitigating measures were already identified in the previous chapter, and the responsibilities for monitoring their implementation and effectiveness must now be specified.

#### Construction Phase and Initial Period of Operation (scope of the EPC contract

Thus, and as general principles, the following should be considered:

During its action, the Contractor resorts to good practices, complies with legal requirements and implements the measures that are under its responsibility, creating records that demonstrate this implementation.

- Weekly it takes stock of the situation, with a factual description of the most relevant facts in environmental and social matters and monthly presents a detailed report containing all the records produced and an assessment of the occurrences in that period.
- The monthly report to be produced by the Contractor, with the structure defined in the revised ESMP, will have to be delivered to the OE by the 5th of the month following the month to which the report refers.

Verification of the Contractor's performance will be the responsibility of the OE, verifying and validating the records produced by the Contractor.

Upon finding serious failures or omissions, the OE will be responsible for directly instructing the Contractor to correct them.

The OE will keep the UGPE informed about the progress of the work, making a monthly status report covering the most relevant facts in environmental and social matters, without prejudice to ad hoc communications in the event of urgent situations.

The performance requirements related to the long-term operation and maintenance of the solar PV plant (by the Operator) will be detailed when preparing the terms of reference for the tender for selection of the Operator.

#### Operation Phase

In the operation phase, the same requirements established above for the construction phase and initial period of operation will apply, assuming that in this phase the attributions indicated above for the UGPE will be ensured by the DNICE, without the intervention of the OE, whose intervention by the State Budget will have ended at this stage.

### 6.9.2 Indicators

The monitoring of the environmental and social management of the Project can be done using the following set of indicators:

- Non-conformities: Number of non-conformities (non-compliance with environmental and social management measures) identified either a) by OE or b) by the UGPE Environmental and Social Specialist;

- Complaints received: number of complaints received through a) the GRM or b) other means;
- Average resolution time for non-conformities identified;
- Average response time to complaints received;
- Average time taken to resolve issues in complaints received;
- Number of workers participating in training and awareness-raising sessions;
- Quantity of waste produced (by type provided for in the National Waste List, verified through the respective Monitoring Guides);
- Quantity of waste, by type of management operation to which it was subject, with verification through the respective Monitoring Guides).
  - Number of new jobs created.
  - Number of jobs eliminated.
  - Number of permanent jobs created / eliminated.
  - Number of jobs for women created / eliminated.
  - Number of workers in the month in question.
  - Number of accidents (with sick leave, including fatalities, and without sick leave).
    - Number of days lost due to accidents at work.
    - Number of hours of exposure to risk or number of working hours.
    - Work accident frequency index<sup>4</sup>.
    - Index of incidence of accidents at work<sup>5</sup>
    - Occupational accident severity index<sup>6</sup>.

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<sup>4</sup>Frequency index: The frequency index indicates how many accidents with sick leave, including fatal ones, occur in every million man-hours performed and is represented by the expression:

$$IF = \frac{N \cdot 10^6}{T}$$

N= Number of accidents at work with sick leave, including fatal ones.

T= No. of hours of exposure to risk.

<sup>5</sup>Incidence rate: The incidence rate indicates the number of accidents with sick leave, including fatal ones, per thousand workers and is calculated using the expression:

$$I_i = \frac{N \cdot 10^3}{NT}$$

N= Number of accidents at work with sick leave.

NT = Average number of workers

<sup>6</sup>Severity index: The severity index indicates the number of days lost due to an accident at work per thousand man-hours performed, calculated using the expression:

- Quantity of water consumed (m<sup>3</sup>), by sources (public supply system, other).
- Quantity of aggregates (sand, gravel, rock, in tons), with verification of licensed origin.

These indicators should be calculated monthly throughout the life cycle of the PV plant and presented and discussed in reports to be prepared by the OE.

## 6.10 Estimated time schedule and costs of implementing the ESMP

An important part of the measures recommended in this ESMP has to do with the compliance with legal requirements or good practices that the Contractor and the Operator must necessarily assume in their current costs.

At the moment there is no estimate available of the costs foreseen for the implementation of the photovoltaic park. However, it is estimated that the costs directly related to environmental and social management may represent between 15 and 25% of the general management costs for the construction and operation of the photovoltaic park.

The costs of mitigation measures for the planning phase indicated as being the responsibility of UGPE will be met as part of the ongoing costs of managing the Project and no relevant capital costs are expected.

The remaining costs will be borne directly by the contractor to be selected, and no relevant capital costs are expected in this case either.

The following table summarizes the environmental and social management activities to be implemented for the subcomponent 1.1 of Project (photovoltaic plant and their respective interconnections with the electric grid and the battery storage systems), indicating also the responsible parties and the estimated cost.

*Table 6.1 – ESMP Implementation Budget*

Activity	Responsibility	Estimated cost	Comments
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$$I_g = \frac{Dp \cdot 10^3}{T}$$

Dp = Number of days lost due to accidents at work.

T = Number of hours of exposure at risk.

According to a resolution of the 6th International Conference of Labor Statisticians, a fatal accident is equivalent to the loss of 7,500 days of work.

<b>Implementation of mitigation measures (Contractor and Operator)</b>	Contractor, Operator	-	The environmental and social management measures to be implemented by the contractor and the operator will relate exclusively to compliance with the applicable legal requirements and/or best practices and will have a reduced cost, which should be included in the general budget of the respective contracts. It is not foreseen the need to implement any environmental or social measure that implies investment costs.
<b>Environmental and Social Monitoring and Auditing</b>	UGPE	12,000 USD	Lump sum estimation of the costs associated with E&S monitoring and auditing of the project, including possible audits to be carried out by the external entities (eg National Directorate for the Environment, Delegations of the Environment and Agriculture Ministry, Municipalities). The operational costs of the Owner's Engineer and UGPE teams are not included in this estimation
<b>Stakeholder Engagement</b>	UGPE	5,000 USD	Lump sum estimation of the costs associated with the stakeholder engagement, including public meetings, disclosure of information documents. The operational costs of the Owner's Engineer and UGPE teams are not included in this estimation
<b>Grievance Mechanism</b>	UGPE, Local and Central Grievances Management Committees	10,000 USD	Lump sum estimation of the costs associated with the GRM, including the Local and Grievances Management Committees. The operational costs of the UGPE team are not included in this estimation.
<b>Capacity Building (as detailed in the Environmental and Social Commitment Plan)</b>	Owner's Engineer, Contractor, Operator, ICIEG	21,500 USD	Lump sum estimation of the costs associated with organizing and delivering the capacity building sessions, including mobilization of participants. The operational costs of the Owner's Engineer and UGPE teams are not included in this estimation
<b>Training of Project Workers (initial training of the Contractor's and Operator's management staff before ensuring the training of the workers)</b>	Owner's Engineer, Contractor, Operator, ICIEG	10,000 USD	Lump sum estimation of the costs associated with organizing and delivering the training sessions. The operational costs of the Contractor's, Operator's, Owner's Engineer and UGPE teams are not included in this estimation
<b>Total</b>		<b>58,500 USD</b>	

The environmental and social management measures borne by the Contractor (and the Operator) are entirely related to compliance with legal requirements and/or applicable good practices and will have a reduced cost that must be included in the general budget of the contract.

It is not foreseen the need to implement any environmental or social measure that implies investment costs.

The costs with the implementation of the GRM and with the training borne by the UGPE are covered by the general budget of the Project.

In terms of time schedule , within a maximum period of 2 weeks before the start of the works, the Contractor will present for approval by the UGPE (assisted by the OE) the revision of this ESMP (including the HSP), complementing and detailing it, explaining its understanding regarding the impacts envisaged environmental and social measures and the corresponding mitigation measures, describing:

**The organization and human and material resources that will be allocated to the environmental and social management of its intervention.**

**The methods, procedures, equipment, and materials to be used to carry out the work, with a view to preventing, correcting, or compensating for the environmental and social impacts of its intervention.**

**The plan for the construction yard, with particular detailing of the planned measures to respond to the established environmental and social requirements.**

**The way in which it will articulate environmental management with the management of safety and health at work.**

**The records that will be produced to demonstrate compliance with the planned mitigation measures and the proposed structure for the monthly reports to be presented during the term of the contract.**

**The specific timetable for the environmental and social management actions and measures to be implemented and their relationship with the general timetable for the works.**

Two weeks before the start of the initial period of operation (under the EPC contract) the Contractor will submit for approval by the UGPE the updated ESMP, including the HSP, for the operation phase.

The requirements for the implementation of the ESMP by the Operator (phase subsequent to the initial period of operation to be borne by the Contractor) will be established when drawing up the terms of reference for contracting the Operator but will in principle comply with the same general principles established above for the Contractor.

These requirements will also cover the deactivation phase of the solar PV plant, assuming that this will be carried out by the Operator.

## **6.11 Review of the environmental management plan**

The provisions of this ESMP should be reviewed whenever it becomes necessary to update the applicable legislation, change the actions / procedures to be implemented according to the impacts actually verified and the results of monitoring.

It will be the UGPE's responsibility , with the support of the OE, to work with the various stakeholders to ensure that these updates are made and communicated to all parties whose actions may be subject to change.

## **6.12 Capacity Building**

Apart from the Project workers training mentioned above, the ESCP considers a series of capacity-building initiatives for the UGPE, other institutions and Project implementing partners, covering themes as:

- Health and safety.
- Working conditions.
- Risk management.
- Waste management.
- Gender based violence.
- Grievance redress mechanism

## 6 Final considerations

The work carried out allowed the conclusion that the development of the photovoltaic park in the ZDER of Furna, on the island of Brava, is viable from the environmental and social point of view, and that no significant negative risks or impacts are foreseen that could condition the recommendations regarding the configuration of the photovoltaic park formulated in the *Site Appraisal Report* (Site Assessment Report).

However, we recommend a set of measures that are considered relevant to ensure the sustainability intended for this use of solar energy.

In the course of the work that led to the presentation of this study, no gaps in knowledge were identified that could condition or limit in a determinant way the conclusions presented here.

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## ANNEXES

### Annex A: Comparison of the national legal framework and the World Bank's SAF requirements

ENVIRONMENTAL AND SOCIAL STANDARDS (World Bank)	NATIONAL LEGISLATION	GAPS OR CONFLICTS
<b>ESS 1: Evaluation and Management of Environmental and Social Risks and Impacts</b>		
<p>Objectives of the ESS 1:</p> <ul style="list-style-type: none"> <li>- Identify, assess and manage the project's socioenvironmental risks and impacts in a manner consistent with the ESS</li> <li>- Adopt a hierarchy approach to mitigate risks and impacts</li> <li>- Adopt differentiated measures so that negative impacts do not fall disproportionately on the disadvantaged or vulnerable and that they are not disadvantaged in sharing the benefits and development opportunities resulting from the project.</li> <li>- Use national environmental and social institutions, systems, laws, regulations and procedures in project evaluation, development and implementation, where appropriate. - Promote better environmental and social performance in order to recognise and strengthen the capacity of the Borrower.</li> </ul> <p>In the case of projects with multiple sub-projects, ESS 1 provides that these sub-projects may be of: High Risk, Substantial Risk, Moderate Risk or Low Risk.</p>	<p>Cape Verde's Legal Framework for Environmental Impact Assessment (RJAIA) was recently revised (Decree 27/2020) with the aim, among others, of achieving a more evident and systematic adherence of national requirements to good practices and to the typical requirements of international financial and development support institutions</p> <p>The new RJAIA provides for 3 categories of EIA: Category A, applicable to types of projects with a higher environmental risk profile and corresponding to the need to prepare an Environmental Impact Study (EIA); Category B, applicable to types of projects with an intermediate environmental risk profile, for which the preparation of a Simplified Environmental Study (EAS) is required; and Category C, applicable to types of projects with a lower environmental risk profile, requiring the presentation of Environmental Management Measures to be implemented.</p>	<p>No significant gaps or conflicts are identified between the requirements of ESS1 and those of national EIA legislation.</p>

ENVIRONMENTAL AND SOCIAL STANDARDS (World Bank)	NATIONAL LEGISLATION	GAPS OR CONFLICTS
<b>ESS 2: Labour and Working Conditions</b>		

<p>Objectives of the ESS 2:</p> <ul style="list-style-type: none"> <li>- Promote safe and healthy working conditions. Promote fair treatment, non-discrimination and equal opportunities for project workers.</li> <li>- Protect project workers, including vulnerable categories of workers such as women, individuals with disabilities, children (of working age in accordance with this ESS) and migrant workers, contract workers, community workers and primary supply workers.</li> <li>- Avoid the use of all forms of forced and child labour. - Support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national legislation.</li> <li>- Provide accessible means for project workers to raise concerns in the workplace.</li> </ul>	<p>Cape Verde has ratified International Labour Organisation Conventions, namely all 8 Fundamental Conventions (on Forced Labour, Freedom of Association and Protection of the Right to Organise, Right to Organise and Collective Bargaining, Equal Remuneration, Abolition of Forced Labour, Minimum Age and Worst Forms of Child Labour), 2 of the 4 Governance Conventions (Labour Inspection and Tripartite Consultations Concerning International Labour Standards) and 6 of the Technical Conventions: Worker's Compensation (Accidents), Equal Treatment (Accident Compensation), Social Security (Minimum Age), Equal Treatment (Social Security), Occupational Safety and Health and Maritime Labour).</p> <p>Cape Verde's labour legislation ("Labour Code") was updated in 2016 (Regulatory Decree 1/2016) and key issues covered include, among others:</p> <ul style="list-style-type: none"> <li>- The principles of non-discrimination (with regard to gender, race, colour, religion, political opinion or social origin) and equal opportunities.</li> <li>- The law allows workers to form and join trade unions of their choice without prior authorization or undue requirements. The law allows unions to conduct their activities without government interference and gives union members the right to strike.</li> <li>- The law provides for the right of workers to bargain collectively.</li> <li>- The law prohibits anti-union discrimination. - The law prohibits forced or compulsory labour, including by children.</li> </ul>	<p>No significant gaps or conflicts are identified between the requirements of ESS2 and those of national legislation on labour and working conditions. At most, it should be noted that national legislation does not have as explicit requirements as ESS2 on labour management procedures or the adoption of a formal project-specific code of conduct, aspects that should thus be addressed in accordance with ESS2.</p>
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ENVIRONMENTAL AND SOCIAL STANDARDS (World Bank)	NATIONAL LEGISLATION	GAPS OR CONFLICTS
	<ul style="list-style-type: none"> <li>- Currently, the legal minimum age for employment is 15 years.</li> <li>- The minimum wage in Cape Verde is currently 15 000 ECV (136 Eur).</li> <li>- The law sets the maximum working week for adults at 44 hours, prohibits excessive compulsory overtime, and requires that a premium be paid for any overtime worked.</li> </ul> <p>Also of note is Decree-Law 55/99 of 6 September 1999, which establishes health and safety standards at work, and Decree-Law 64/2010 of 27 December 2010, which establishes general rules on planning, organisation and coordination to promote health and safety on construction sites.</p>	

ENVIRONMENTAL AND SOCIAL STANDARDS (World Bank)	NATIONAL LEGISLATION	GAPS OR CONFLICTS
<b>ESS 3: Resource Efficiency, Pollution Prevention and Management</b>		
<p>Objectives of the ESS 3:</p> <ul style="list-style-type: none"> <li>- Promote the sustainable use of resources, including energy, water and raw materials.</li> <li>- Avoid or minimise negative impacts on human health and the environment, avoiding or minimising pollution from project activities.</li> <li>- Avoid or minimise project-related emissions of short and long-lived pollutants.</li> <li>- Avoid or minimise the generation of hazardous and non-hazardous waste.</li> <li>- Minimise and manage the risks and impacts associated with the use of pesticides.</li> </ul>	<p>In the field of waste, to mention Decree-Law No. 56/2015 of 17 October establishes the general waste regime, applicable to the prevention, production and management of waste, Decree-Law No. 26/2020 of 19 March establishing the legal regime for solid urban waste management services, Decree-Law No. 65/2018 approving the National Waste List, Decree-Law No. 32/2016 approving the National Strategic Plan for Waste Management and Ordinance No. 18/2016 establishing the guide model for monitoring waste road transport.</p> <p>In terms of water and sanitation, Legislative Decree no. 3/2005 of 19 October approves the Water and Sanitation Code, Decree-Law no. 8/2004 regulates the criteria and standards for water quality and its classification, Decree-Law no. 7/2004 regulates the discharge of wastewater and Regulatory Decree no. 4/2020 of 4 March establishes the criteria and parameters to control the quality of water for irrigation, of surface or underground origin, desalinated water, recovered rainwater or treated wastewater;</p> <p>Decree-Law No. 5/2003 of 31 March defines the national system for the protection and control of air quality;</p>	<p>The legal framework is relatively complete but lacks specific regulations in many areas; national practice in emission control and environmental quality monitoring is relatively incipient. This justifies the use of good practices and international guidelines to complement the existing gaps in the country.</p>

	<p>Law nº 34/VIII/13 of 24 July establishes the prevention and control of noise pollution, aiming to safeguard people's rest, peace and well-being.</p>	
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ENVIRONMENTAL AND SOCIAL STANDARDS (World Bank)	NATIONAL LEGISLATION	GAPS OR CONFLICTS
<b>ESS 4: Community Health and Safety</b>		



<p>Objectives of the ESS 4:</p> <ul style="list-style-type: none"> <li>- Anticipate and avoid adverse impacts on the health and safety of communities affected by the project during its life cycle, both in routine and non-routine circumstances.</li> <li>- Promote quality and safety, as well as climate change considerations, in the design and construction of infrastructure, including dams.</li> <li>- Avoid or minimise community exposure to project-related road and traffic safety risks, diseases and hazardous materials.</li> <li>- Have effective measures in place to deal with emergencies.</li> <li>- Ensure the protection of employees and property so as to avoid or minimise risks to project-affected communities.</li> </ul>	<p>The consideration of health and safety risks associated with the implementation of the Project adequate to the specificities of the Project and its area of influence is one of the requirements of RJAIA (Decree 27/2020). Law No. 84/VII/2011 establishes the measures to prevent and repress the crime of gender-based violence (GBV Law). Legislative Decree no. 4/2005 (amended by Legislative Decree no. 1/2007, of May 11 - Cape Verde Labour Code approves the Road Code. Law 8/V/96, of 11 November, amended by Law 59/VII/2010, of 19 April, prohibits the driving of vehicles by individuals under the influence of alcohol. Law No 50/VII/2009 defines the legal regime for the exercise of private security activity.</p>	<p>No significant gaps or conflicts are identified between the requirements of ESS4 and those of national legislation, which, however, does not have requirements as explicit as ESS4. which should therefore be taken into account. Specifically with regard to private security services, the requirements in national legislation are considerably aligned with the requirements set out in ESS 4.</p>
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ENVIRONMENTAL AND SOCIAL STANDARDS (World Bank)	NATIONAL LEGISLATION	GAPS OR CONFLICTS
<b>ESS 5: Land acquisition, restrictions on land use and involuntary resettlement</b>		

<p>Objectives of the ESS 5:</p> <ul style="list-style-type: none"> <li>- Avoid involuntary resettlement or, where unavoidable, minimise involuntary resettlement by exploring project design alternatives.</li> <li>- Avoid forced dumping.</li> <li>- Mitigate unavoidable negative social and economic impacts linked to land acquisition or restrictions on land use through the following strategies: (a) providing compensation, in a timely manner, for the loss of assets at replacement cost and (b) assisting displaced individuals in their efforts to improve, or at least restore, their livelihoods and standard of living, in real terms, to the levels prevailing prior to the start of project implementation, whichever is greater. - Improve the living conditions of poor or vulnerable individuals who are physically homeless through the provision of adequate housing, access to services and facilities, and security of tenure.</li> <li>- Design and implement resettlement activities as sustainable development programmes, providing sufficient investment resources to enable displaced individuals to benefit directly from the project, as the nature of the project may justify.</li> <li>- Ensure that resettlement activities are planned and implemented with adequate information dissemination, relevant consultation and informed participation of affected individuals.</li> </ul>	<p>Legislative Decree No. 2/2007 of 19 July approves the Soil Law.</p> <p>Legislative Decree no. 3/2007 of 19 July establishes the requirements for expropriation of real estate on the grounds of public utility.</p>	<p>National legislation has significant gaps in relation to the requirements of the ESS5. Thus, while there is convergence on aspects such as the types of payment, in-kind compensation, consideration of squatters and the determination of the eligibility date, in several other aspects there are gaps or even divergence between national legislation and ESS 5, namely with regard to persons eligible for compensation the fact that irregular occupants are not covered, relocation assistance, compensation alternatives, the nonconsideration of economic displacement, the absence of specific provisions to protect vulnerable groups, adequate dissemination of information, relevant consultation and informed participation or the monitoring and evaluation procedures.</p> <p>In other words, the sole consideration of national legislation does not make it possible to safeguard an important set of ESS5 requirements.</p>
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ENVIRONMENTAL AND SOCIAL STANDARDS (World Bank)	NATIONAL LEGISLATION	GAPS OR CONFLICTS
<b>ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</b>		

<p>Objectives of ESS 6:</p> <ul style="list-style-type: none"> <li>- Protect and conserve biodiversity and habitats. - Apply the mitigation hierarchy and the precautionary strategy in the design and implementation of projects that may have an impact on biodiversity. - Promote the sustainable management of living natural resources.</li> <li>- Support local community livelihoods, including Indigenous Peoples, and inclusive economic development through the adoption of practices that integrate conservation needs and development priorities.</li> </ul>	<p>Decree-Law No. 3/2003 of 24 February, as amended by Decree-Law No. 44/2006 of 28 August, which establishes the legal framework relating to natural spaces, landscapes, monuments and other spaces that merit special protection and must be integrated in the National Network of Protected Areas, due to their ecological function, importance for the conservation of biodiversity and interest from a socio-economic, cultural or scientific point of view.</p>	<p>The requirements of ESS6 should be applied in addition to what follows from national legislation (specifically in relation to protected areas).</p>
<p><b>ESS 8: Cultural Heritage</b></p>		
<p>Objectives of ESS 8:</p> <ul style="list-style-type: none"> <li>- Protect cultural heritage from negative impacts of project activities and support its preservation. - Addressing cultural heritage as a key aspect of sustainable development.</li> <li>- Promote relevant consultation with stakeholders in relation to cultural heritage.</li> <li>- Promote the equitable distribution of the benefits of cultural heritage use.</li> </ul>	<p>Law nº 85/IX/2020 of 20 April establishes the Legal Regime of Protection and Values of Cultural Heritage</p>	<p>Recent national legislation is reasonably aligned with ESS8 requirements, with no significant gaps or conflicts identified.</p>
<p><b>ENVIRONMENTAL AND SOCIAL STANDARDS (World Bank)</b></p>	<p><b>NATIONAL LEGISLATION</b></p>	<p><b>GAPS OR CONFLICTS</b></p>
<p><b>ESS 10: Stakeholder Engagement and Disclosure</b></p>		

<p>Objectives of ESS 10:</p> <ul style="list-style-type: none"> <li>- Establish a systematic stakeholder engagement strategy, which will help the Borrowers to create and maintain a constructive relationship with stakeholders and in particular with project affected parties. - Assess the level of stakeholder interest and support for the project and enable their views to be considered in project design and environmental and social performance.</li> <li>- Promote and provide means for effective and inclusive engagement of project affected parties throughout the project life cycle on issues that could affect them.</li> <li>- Ensure that appropriate information on the project's environmental and social risks and impacts is disseminated to stakeholders in a timely, accessible, understandable and appropriate manner. - Ensure that project-affected communities have accessible and inclusive means to raise issues and complaints, and allow Borrowers to respond to and manage such issues and complaints.</li> </ul>	<p>The new RJAIA (Decree 27/2020) has specific provisions for the participatory component in the different stages of the EIA processes.</p>	<p>Despite the improvements introduced with the new RJAIA, the options adopted in terms of stakeholder involvement and information disclosure do not fully meet the requirements of ESS 6.</p>
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## Annex B: CODES OF CONDUCT

CODES OF CONDUCT FOR IMPLEMENTING ENVIRONMENTAL, SOCIAL AND HEALTH AND SAFETY STANDARDS, OCCUPATIONAL HEALTH AND SAFETY STANDARDS, PREVENTION OF GENDER BASED VIOLENCE, AND PREVENTION OF VIOLENCE AGAINST CHILDREN

(Source: UGPE, 2022)

### 1. Objectives

The objective of these Codes of Conduct for the Implementation of Environmental, Social, Health and Safety (ESHS) and Occupational Health and Safety (OHS) Standards, and Prevention of Gender-Based Violence (GBV) and Violence Against Children (VAC) is to introduce a set of key definitions, fundamental codes of conduct and guidelines that:

Clearly define the obligations for all project workers (including subcontractors and casual workers) regarding the application of the project's environmental, social, health and safety (ESHS) and occupational health and safety (OHS) standards and,

Help prevent, report, and respond to GBV and VAC in the workplace and in the immediate surrounding communities.

Application of these Codes of Conduct will help ensure that the project meets its ESHS and OHS objectives, as well as prevent and/or mitigate the risks of GBV and VAC on the project and in local communities.

These Codes of Conduct should be adopted by those working on the project and are intended to:

**Raise awareness about ESHS and OHS expectations associated with the project.**

**Create a common awareness of the VBG and VAC and:**

- **Ensure a shared understanding that it is not permissible on the project.**
- **Create a clear system for identifying, responding to, and sanctioning incidents related to GBV and VAC.**

**Ensuring that all project workers understand the values underlying the project and the conduct expected of them and recognize the consequences in the event of violation of these values, will contribute to the creation of a respectful and productive work environment, and to the achievement of project goals.**

### 2. Definitions

The following definitions apply:

**Environment, Social, Health and Safety (ESHS):** This is a term covering issues related to the impact of the project on the environment, communities, and workers.

**Occupational Health and Safety (OHS):** Occupational health and safety focus on protecting the safety, health, and well-being of workers. The enjoyment of these standards at the highest level is a basic human right that should be accessible to all

workers.

**Gender-Based Violence (GBV):** This is a term that encompasses any harmful act that is perpetrated against a person's will and is based on socially ascribed differences (i.e., gender) between men and women. It includes acts that inflict physical, sexual, or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private. The term GBV is used to highlight the systemic inequality between men and women (which exists in every society in the world) and acts as a unifying and fundamental characteristic of most forms of violence perpetrated against women and girls. The 1993 United Nations Declaration on the Elimination of Violence against Women defines violence against women as "any act of gender-based violence that results in or is likely to result in physical, sexual or psychological harm or suffering to women."

The six main types of GBV are:

**Rape:** Non-consensual penetration (even if slight) of the vagina, anus or mouth with a penis, other body parts or an object.

- **Sexual Assault:** Any form of non-consensual sexual contact that does not result in or include penetration. Examples include attempted rape, as well as unwanted kissing, fondling, or touching of genitals and buttocks.
- **Sexual Harassment:** These are unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature. Sexual harassment is not always explicit or obvious, it may include implicit and subtle acts, but it always involves a power and gender dynamic where one person in power uses their position to harass another based on their gender. Sexual conduct is unwelcomed whenever the person subjected to it considers it undesirable (e.g., looking someone up and down; kissing; howling or making inappropriate sounds; walking around someone; whistling; in some cases, giving personal gifts).

**Sexual Favors:** This is a form of sexual harassment and includes making promises of favorable treatment (e.g., promotion) or threats of unfavorable treatment (e.g., job loss) contingent on sexual acts - or other forms of demeaning, degrading or exploitative behavior.

**Physical Assault:** An act of physical violence that is not sexual in nature. Examples include hitting, slapping, choking, and cutting, pushing, burning, shooting, or using any weapon, acid attacks or any other act that results in pain, discomfort, or injury.

**Forced Marriage:** The marriage of a person against their will.

**Denial of Resources, Opportunities or Services:** Denial of legitimate access to economic/active resources or opportunities for livelihood, education, health, or other social services (e.g., a widow prevented from receiving an inheritance, income forcibly taken away by an intimate partner or family member, a woman prevented from using contraceptives, a girl prevented from attending school, etc.).

**Psychological/Emotional Abuse:** Infliction of mental or emotional pain or injury. Examples include threats of physical or sexual violence, intimidation, humiliation, forced isolation, stalking, harassment, unwanted attention, remarks, gestures, or written words of a sexual and/or threatening nature, destruction of cherished things, etc.

**Violence Against Children (VAC):** Is defined as physical, sexual, emotional, and/or psychological harm, neglect, or negligent treatment of children under the age of 18 (i.e., under 18 years), including exposure to such harm that results in actual or potential harm to the child's health, survival, development, or dignity in the context of a relationship of responsibility, trust, or power. This includes the use of children for profit, work, sexual gratification, or some other personal or financial advantage. It also includes other activities such as using computers, cell phones, video and digital cameras, or any other means to exploit or harass children or access child pornography.

**Grooming:** These are behaviors that make it easier to find a child for sexual activity. For example, an abuser may build a trusting relationship with a child, and then seek to sexualize that relationship (e.g., by encouraging romantic feelings or exposing the child to sexual concepts through pornography).

**Online Grooming:** The act of sending an electronic message with indecent content to a recipient whom the sender believes to be a minor, with the intention that the recipient will engage in or submit to some type of sexual activity with another person, including but not necessarily including the sender.

**Accountability Measures:** These are the measures in place to ensure the confidentiality of survivors and to hold contractors, consultants, and the client accountable for implementing a fair system for handling cases of GBV and VAC.

**Construction Environmental and Social Management Plan (C-ESMP):** This is the plan prepared by the contractor that describes how construction activities will be implemented in accordance with the environmental and social management plan defined for the Project (ESMP).

**Child:** Term used interchangeably with the term "minor" and refers to a person under the age of 18. This definition is in accordance with Article 1 of the United Nations Convention on the Rights of the Child.

**Child Protection (CP):** Is an activity or initiative aimed at protecting children from any form of harm, particularly from VAC.

**Consent:** Is the informed choice underlying an individual's free and voluntary intention, acceptance, or agreement to do something. It is not considered consent when such acceptance or agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even if the national legislation of the country in which the Code of Conduct is applied provides for a lower age. The mistaken belief about the age of the child and the child's consent is not a defense.

**Consultant:** Is any company, organization or other institution that has been awarded a contract to provide consulting services for the project and has hired managers and/or employees to carry out this work.

**Contractor:** is any company, organization or other institution that has been awarded a contract to carry out infrastructure development work for the project and has hired managers and/or employees to carry out this work. This also includes subcontractors hired to perform activities on behalf of the contractor.

**Worker:** Any person who provides individual labor to the contractor or consultant within the country, on or off-site, under a formal or informal employment contract,

typically but not necessarily (including unpaid interns and volunteers), in exchange for a salary, without responsibility for managing or supervising other workers.

**Manager:** Any individual person who provides labor to the contractor or consultant, on or off the job, under a formal or informal employment contract and in exchange for a salary, with responsibility for controlling or directing the activities of a contractor's or consultant's team, unit, division or similar, and for supervising and managing a predefined number of workers.

**GBV and VAC Allegation Procedure:** The procedure for reporting incidents of GBV or VAC.

**GBV and VAC Codes of Conduct:** The Codes of Conduct adopted for the project that cover the company's commitment as well as the responsibilities of managers and individuals with respect to GBV and VAC.

**GBV and VCA Compliance Team (GCCT):** Experts responsible for addressing GBV and VAC issues associated with the project.

**Feedback and Grievance Redress Mechanism (FGRM):** The procedure established by a project to receive and respond to suggestions and complaints.

**Aggressor:** The person(s) committing or threatening to commit an act or acts of GBV or VAC.

**Response Protocol:** The mechanisms established to respond to cases of GBV and VAC.

**Survivors:** The person(s) adversely affected by GBV, or VAC. Women, men, and children can be survivors of GBV; children can be survivors of VAC.

**Work Site:** The area in which infrastructure development work is being conducted as part of the project. Consulting assignments are considered to have the areas in which they are active as work sites.

**Work Site Surroundings:** The "Project Area of Influence" is any area, urban or rural, directly affected by the project, including all human settlements found therein.

### 3. Codes of Conduct

This chapter presents three Codes of Conduct for use:

**Company Code of Conduct** commits the company to address issues of GBV and VAC.

**Manager Code of Conduct:** Commits managers to implement the Company's Code of Conduct as well as those subscribed to by employees on an individual level.

**Individual Code of Conduct:** Code of Conduct for everyone working on the project, including managers.

## Company Code of Conduct

### Implementation of ESS and OHS Standards

#### **Prevention of Gender Based Violence and Violence Against Children**

The company is committed to ensuring that the project is implemented in a way that minimizes any negative impacts on the local environment, communities, and its workers. This will be done by respecting environmental, social, health and safety standards (ESHS) and ensuring that appropriate occupational health and safety standards (OHSS) are met. The company is also committed to creating and maintaining an environment in which gender-based violence (GBV) and violence against children (VAC) do not occur and are not tolerated by any employee, subcontractor, supplier, associate, or representative of the company.

Therefore, to ensure that all project participants are aware of this commitment, the company commits to the following fundamental principles and minimum standards of behavior applicable to all employees, associates, and company representatives, including subcontractors and suppliers, without exception:

##### General

1. The company, and therefore all employees, associates, representatives, subcontractors, and suppliers, undertake to comply with all relevant national laws, rules, and regulations.
2. The company commits to fully implement its Construction Environmental and Social Management Plan (C-ESMP).
3. The company undertakes to treat women, children (under 18) and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic, or social origin, property, disability, birth, or other status. The acts of VBG and VAC violate this commitment.
4. The company will ensure that interactions with members of the local community are conducted respectfully and without discrimination.
5. Humiliation, threatening, harassing, abusive, culturally inappropriate, or sexually provocative language and behavior are prohibited among all company employees, associates, and their representatives, including subcontractors and suppliers.
6. The company will follow all reasonable work instructions (including environmental and social standards).
7. The company will protect and ensure the proper use of assets (e.g., to prohibit theft, carelessness, or waste).

##### Health and Safety

8. The company will ensure that the project's Occupational Health and Safety Management Plan (OH&SMP) is effectively implemented by company employees, as well as subcontractors and suppliers.

9. The company will ensure that everyone in the workplace wears prescribed and appropriate personal protective equipment, preventing preventable accidents and reporting conditions or practices that pose a safety hazard or threaten the environment.

10. The company shall prohibit:

- i. The use of alcohol during work activities.
- ii. The use of narcotics or other substances that may impair the faculties.

11. The company will ensure that adequate toilet facilities are available on site and in any worker, accommodations provided to those working on the project.

### **Gender-Based Violence and Violence Against Children**

12. Acts of GBV or VAC constitute serious misconduct and are therefore grounds for sanctions on perpetrators, which will depend on the act, and may in the most serious cases result in termination of employment, and, where appropriate, notification of the authorities.

13. All forms of GBV and VAC, including grooming, are unacceptable, regardless of whether they take place in the workplace, in the workplace environment, on construction sites or in local communities.

- i. Sexual harassment - for example, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature, including subtle acts of such behavior - is prohibited.
- ii. Sexual favors - for example, making promises or favorable treatment contingent upon sexual acts - or other forms of humiliating, degrading or exploitative behavior are prohibited.

14. Sexual contact or activity with children under the age of 18 - including through digital means - is prohibited. A mistaken belief about a child's age is not a justification. The child's consent also cannot be used as a justification or excuse.

15. Unless there is full consent of all parties involved in the sexual act, sexual interactions between company employees (at any level) and members of the communities surrounding the workplace are prohibited. This includes relationships that involve withholding/promising to actually provide benefits (monetary or non-monetary) to community members in exchange for sex - such sexual activity is considered "non-consensual" under this Code.

16. In addition to company sanctions, prosecution of those who commit acts of GBV, or VAC will be initiated if appropriate.

17. All employees, including volunteers and subcontractors, are strongly encouraged to report suspected or actual acts of GBV and/or VAC by a colleague, whether in the same company or not. Reports must be made in accordance with the project's GBV and VAC allegation procedures.

18. Managers are required to report and take action in the event of suspected or actual acts of GBV and/or VAC, as they have a responsibility to respect the company's commitments.

## Implementation

To ensure that the above principles are effectively implemented, the company undertakes to ensure that:

19. All managers sign the 'Manager's Code of Conduct' established for the project, detailing their responsibilities in carrying out the company's commitments and applying the responsibilities set out in the 'Individual Code of Conduct'.

20. All employees sign the 'Individual Code of Conduct' established for the project, confirming their acceptance regarding compliance with NASSS and HSO, and to not committing acts that result in GBV or VAC.

21. Company Codes of Conduct as well as Individual Codes of Conduct are displayed prominently and in conspicuous places on construction sites, offices and in public areas of the workspace. For example, in waiting areas, rest areas, canteen and medical office.

22. Company Codes of Conduct as well as Individual Codes of Conduct are translated into local languages.

23. The company will appoint a "Focal Point" to address GBV and VAC issues, including representing the company on the GBV and VAC Compliance Team, which is composed of representatives from the customer, contractor(s), supervisory consultant, and local service provider.

24. Effective GBV and VAC action plans will be developed consistent with the GBV Prevention and Response Action Plan prepared for the Project.

25. The company effectively implements the action plans for GBV and VAC, providing feedback to the GBV and VAC Compliance Team for improvements and updates as appropriate.

26. All employees attend an induction training course before starting work on site to ensure they are familiar with the company's NESHS and SSO commitments, as well as the Project's GBV and VAC Code of Conduct.

27. All employees receive regular periodic training, following induction training, to reinforce their understanding of ESHS and HSO and the GBV and VAC Code of Conduct.

I hereby acknowledge that I have read the Company's Code of Conduct, and on behalf of the Company agree to abide by the provisions set forth therein. I understand my role and responsibilities in supporting ESHS and OHS standards and in preventing and responding to GBV and VAC. I understand that any act inconsistent with this Company Code of Conduct or failure to act mandated by this Company Code of Conduct may result in disciplinary sanctions.

Company Name:

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Signature:

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Printed Name:

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Title:

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Date:

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## Manager Code of Conduct

### Implementation of ESHS and OHS Standards

#### **Preventing Gender Based Violence and Violence against Children**

Managers at all levels have a responsibility to uphold the company's commitment to implement ESHS and OHS standards, and prevent and respond to acts of GBV and VAC. This means that managers have responsibility to create and maintain an environment that respects these standards and prevents GBV, and VAC. Managers need to support and promote the implementation of the Company's Code of Conduct. To this end, managers must adhere to this Code of Conduct, and sign the Individual Code of Conduct. This commits them to support the implementation of the C-ESMP and the OHSMP, and to develop systems that facilitate the implementation of the GBV and VAC Prevention and Response Action Plan. They need to ensure a safe workplace, as well as an environment free of GBV and VAC, both in the workplace and in local communities. These responsibilities include, but are not limited to the following:

#### **Implementation**

1. To ensure maximum effectiveness of the Company Code of Conduct and Individual Codes of Conduct:
  - i. Display these codes prominently and in conspicuous locations on construction sites, offices and in public areas of the workspace. For example, in waiting areas, break areas, canteen and medical office.
  - ii. Ensure that these codes are translated into local languages.
2. Verbally and in writing explain to all employees the Company Code of Conduct and the Individual Codes of Conduct.
3. Ensure that:
  - i. All employees sign the "Individual Code of Conduct", including an acknowledgement that they have read and agree to the Code.
  - ii. Employee lists and signed copies of the Individual Code of Conduct are provided to the OHS Manager, the GBV and VAC Compliance Team, and the customer.
  - iii. Participates in training and ensures that all employees also participate as described below.
  - iv. Create an FGRM for workers:
  - v. Staff are encouraged to report suspected or actual GBV or VAC issues, emphasizing staff responsibility to the Company and the country hosting their employment, and emphasizing respect for confidentiality.
4. In accordance with applicable laws and to the best of their ability, prevent perpetrators of sexual exploitation and abuse from being hired, rehired, or promoted. Request a criminal background check from all workers.

5. Ensure that when entering into partnership agreements, subcontractors, suppliers or the like, these agreements:

- i. Incorporate the ESHS, OHS, VBG and VAC Codes of Conduct.
- ii. Use appropriate language requiring such contractors and individuals, as well as their employees and volunteers, to comply with the Individual Codes of Conduct.
- iii. Have expressly stated that the failure of such entities or individuals, as the case may be, to ensure compliance with ESHSS and OHS, to take preventive measures against GBV and VAC, to investigate alleged acts of GBV and VAC, or to adopt and implement corrective measures when such allegations are confirmed, will not only constitute grounds for sanctions in accordance with the Individual Codes of Conduct, but also grounds for termination of agreements to work on or provide the Project.

6. Provide support and resources to the GBV and VAC Compliance Team to create and disseminate internal awareness initiatives through the awareness strategy under the GBV and VAC Prevention and Response Action Plan.

7. Ensure that any act of GBV or VAC that warrants police action is immediately reported to law enforcement, the client, and the World Bank.

8. Present and act on the protocol for responding to any suspected or actual acts of GBV and/or VAC.

9. Ensure that any incidents of ESHS or OHS significance are immediately reported to the client and the supervising engineer.

### **Training**

10. Managers are responsible for:

- i. Ensuring the implementation of the OHSMP, with appropriate training required for all personnel, including subcontractors and suppliers; and,
- ii. Making sure that all workers have an adequate understanding of the C-ESMP and have adequate training to implement the C-ESMP.

11. All managers are required to attend a manager training course prior to starting work on site to ensure that they are familiar with their roles and responsibilities in maintaining the VBG and VAC elements of these Codes of Conduct. This training will be separate from the induction training course required of all workers and will provide managers with the understanding and technical knowledge necessary to implement the GBV and VAC Prevention and Response Action Plan.

12. Managers are required to attend and participate in periodic training courses provided to workers on a regular basis. Managers will be required to present the trainings and announce self-assessments, including the collection of satisfaction surveys to evaluate training experiences and provide advice on improving training effectiveness.

13. Make sure that time is given during working hours for workers to receive training and that all workers receive initial induction training before they start work covering the following topics:

- i. ESHS and OHS; and,
- ii. VBG and VAC.

### **Response**

14. Managers will be required to take appropriate action to resolve any ESHSS or OHS incidents.

15. With regard to GBV and VAC:

- i. They shall contribute to the GBV, and VAC allegation procedures and Response Protocol developed by the GCCT under the GBV and VAC Prevention and Response Action Plan.
- ii. Once the GBV and VAC Prevention and Response Action Plan is adopted by the Company, managers will ensure that the necessary measures are in place to ensure the confidentiality of all employees who report or (allegedly) commit acts of GBV and VAC (unless it is a breach of confidentiality necessary to protect persons or property from serious harm or required by law.
- iii. If a manager has concerns or suspicions of acts of GBV or VAC regarding one of their workers or workers of another contractor involved in the work, they are required to report the matter using the FGRM.
- iv. Once a decision has been made to impose a sanction on an employee, the manager is personally responsible for ensuring that the measure is effectively enforced, no later than 14 days from the date the sanction decision was made.
- v. If the manager has a conflict of interest due to personal or family relationships with the survivor and/or offender, he/she must notify the respective company and the GBV and VAC Compliance Team. The Company will be required to appoint another manager without a conflict of interest to handle the claim in question.
- vi. Ensure that any act of GBV or VAC that warrants police action is immediately reported to the police authorities, the client, and the World Bank.

16. Managers who fail to address ESHS or OHS related incidents, or who fail to report or comply with the provisions applicable to GBV and VAC may be subject to disciplinary measures, to be defined by the CEO, Managing Director, or equivalent manager of the company. Such measures may include:

- i. Informal warning.
- ii. Formal warning.
- iii. Additional training.
- iv. Loss of up to one week's salary.
- v. Suspension from employment (without pay), for a minimum of 1 month up to a maximum of 6 months.
- vi. Termination of employment.

17. Ultimately, the failure of company managers to respond effectively to HSE, HSO, GBV and VAC cases in the workplace is grounds for legal action by the authorities.

I hereby acknowledge that I have read the above manager's code of conduct, agree to abide by the provisions set forth therein, and understand my roles and responsibilities for preventing and responding to HSE, HSP, GBV and VAC requirements. I understand that any action inconsistent with this Manager's Code of Conduct or failure to act mandated by this Manager's Code of Conduct may result in disciplinary action.

Company Name:

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Signature:

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Printed Name:

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Title:

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Date:

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## Individual Code of Conduct

### Implementation of ESHS and OHS Standards

#### **Prevention of Gender-Based Violence and Violence Against Children**

I, *(insert employee's full name)*,

acknowledge that subscribing to the Project's environmental, social, and health and safety (ESHS) and occupational health and safety (OHS) requirements and preventing Gender-Based Violence (GBV) and Violence Against Children (VAC) is important.

The Company considers non-compliance with ESHSS and OHS standards, or participation in GBV or VAC activities, whether in the workplace, its surroundings, on the construction sites or in the surrounding communities, to constitute an act of misconduct subject to sanctions that may culminate in termination of employment. Reporting to the police those committing acts of GBV, or VAC will be carried out as appropriate.

I agree that while working on the Project:

1. I will participate in training courses related to ESHSS, OHS, HIV/AIDS, GBV and VAC as requested by my employer.
2. I will wear my personal protective equipment (PPE) whenever I am in the workplace or engaged in Project-related activities.
3. I will take all practical steps to implement the Construction Environmental and Social Management Plan (C-ESMP).
4. I will implement the OHS Management Plan.
5. I will adhere to a zero-alcohol policy during working hours and refrain from the use of narcotics or other substances that may impair my faculties.
6. I will consent to a criminal background check.
7. I will treat women, children (persons under the age of 18) and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic, or social origin, property, disability, birth, or other status.
8. I will not use inappropriate, harassing, abusive, sexually provocative, demeaning, or culturally inappropriate language or behavior toward women, children, or men.
9. I will not engage in sexually harassing acts, such as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature, including subtle acts of such behavior (e.g., looking down on someone; kissing, howling, or making inappropriate sounds; walking around someone; whistling; giving personal gifts; making comments about someone's sex life; etc.).
10. I will not engage in sexual favors, for example, making promises or favorable treatment contingent on sexual acts or other forms of demeaning, degrading, or exploitative behavior.

11. I will not engage in sexual contact or activity with children, including grooming, or contact through digital means. Mistaken belief about a child's age will not be considered a defense. Nor may the child's consent be used as a defense or excuse.

12. Unless there is full consent of all parties involved, I will not have sexual interactions with members of the surrounding communities. This includes relationships that involve withholding or promising to effectively provide benefits (monetary or non-monetary) to community members in exchange for sex, such sexual activity is considered "non-consensual" under this Code.

13. I will report through the MFRR or to my manager any suspected or actual acts of GBV or CCV committed by a fellow employee, whether or not employed by my company, or any violations of this Code of Conduct.

**Regarding the children under the age of 18:**

14. Whenever possible, I will make sure another adult is present while working near children.

15. I will not invite unaccompanied unrelated children into my home unless they are at immediate risk of injury or in physical danger.

16. I will not use computers, cell phones, video and digital cameras, or any other means to exploit or harass children or access child pornography (see also "Use of child images for work purposes" below).

17. I will not apply physical or disciplinary punishment to children.

18. I will refrain from hiring children under the age of 14 (or such higher age as may be referred to in national law) to perform domestic or other work, or any work that places them at significant risk of injury.

19. I will comply with all relevant legal provisions, including labor laws in relation to child labor, and World Bank safeguard policies on child labor and minimum age.

20. I will be careful when photographing or filming children.

**The Use of Children's Images for Work-Related Purposes**

When photographing or filming a child for work-related purposes, I must:

21. Before photographing or filming a child, evaluate and strive to comply with local traditions or restrictions on reproduction of personal images.

22. Before photographing or filming a child, obtain the informed consent of the child and a parent or guardian. As part of this, I must explain how the photograph or film will be used.

23. Ensure that photographs, films, videos, and DVDs present children in a dignified and respectful manner and not in a vulnerable or submissive manner. Children should be appropriately dressed and not be in poses that could be considered sexually suggestive.

24. Make sure that images are honest representations of context and facts.

25. Make sure that digital file labels for electronic submission do not reveal information about the child's identity.

**Sanctions**

I understand that if I violate this Individual Code of Conduct, my employer will take disciplinary action that may include:

1. Informal warning.
2. Formal warning.
3. Additional training.
4. Loss of up to one week's pay.
5. Suspension from employment (without pay), for a minimum of 1 month up to a maximum of 6 months.
6. Termination of employment.
7. Reporting to the police, if necessary.

I understand that it is my responsibility to ensure that environmental, social, and health and safety standards are met. That I will adhere to the occupational and health management plan. That I will avoid actions or behavior that could be construed as GBV or VAC. Such actions will be a violation of this Individual Code of Conduct.

I hereby acknowledge that I have read the above Individual Code of Conduct, agree to abide by the provisions contained therein, and understand my roles and responsibilities for preventing and responding to ESHS, OHS, GBV and VAC issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to take action mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

# Annex C- Land ownership Declaration, provide by the DGPCP



**Ministério das Finanças e do Fomento Empresarial**  
 Direcção Geral do Património e de Contratação Pública

Avenida Amílcar Cabral, CP nº 30  
 Cidade da Praia  
 República de Cabo Verde  
 Tel.: (+238) 260 74 71

**DECLARAÇÃO Nº 15/PROC. Nº 197/DGPCP/2024**

A Direcção de Geral do Património e de Contratação Pública enquanto órgão competente para gerir os patrimónios do Estado, nos termos do Decreto-Lei nº 2/97 de 21 de janeiro, declara que nos termos do artigo 15 do Decreto-legislativo 02/2007 de 19 de julho, que o lote de terreno medindo 5,81 hectares, situado na ilha da Brava, representada na Planta anexa e declarada ZDER, nos termos da Resolução nº 7/2012 de 03 de Fevereiro, encontra-se disponível para implementação de projetos de produção e/ou armazenamento de energias renováveis.

Mais informa que por ser um terreno vago e sem registo, decorre os tramites normais para registo do terreno nos termos do Decreto Lei nº 35/2017 de 17 de agosto que regula o procedimento de justificação administrativa do domínio privado do Estado.


Por ser verdade e nos ter sido solicitado, vai a presente declaração devidamente assinada pelo Diretor Geral do Património e de Contratação Pública e autenticada com carimbo a óleo em uso nesta instituição.



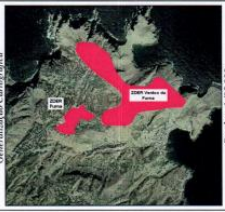
Praia, 27 de junho de 2024

/Francisco Moreira /





**Ministério das Finanças**



ZONA DE FAVATAL  
Generalização Cartográfica


Escala = 1:25.000

**LOCALIZAÇÃO DO TERRENO**

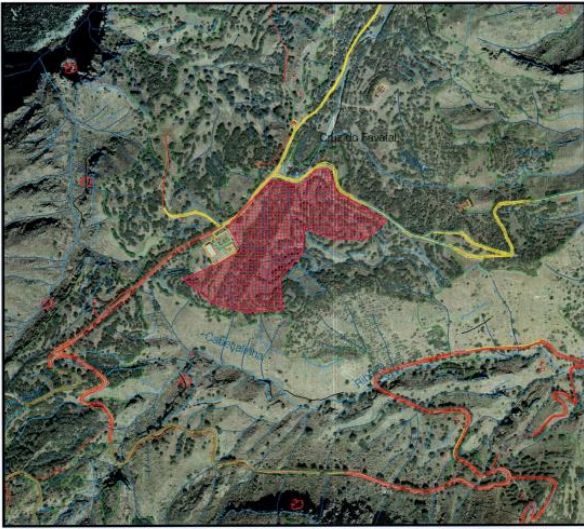
ILHA: BRAVA  
 FREGUESIA: São João Baptista  
 CONCELHO: Brava  
 ZONA: Rural

**CONFRONTAÇÕES**

NORTE: Terreno  
 SUL: Terreno  
 ESTE: Terreno  
 OESTE: Terreno



**MINISTÉRIO DAS FINANÇAS E PLANEAMENTO**  
 DIRECÇÃO GERAL DO PATRIMÓNIO E CONTRATAÇÃO PÚBLICA  
 PLANTA DE LOCALIZAÇÃO DE UM TRACTO DE TERRENO  
 ZONA DE FAVATAL      ÁREA TOTAL 58103,678 m<sup>2</sup> ou 5,81 Ha



Projeção Cónica Secante de Lambert      Escala: 1:5.000      Elaborado Por: ALEXANDRE SANTOS  
 Data: 07/05/2021

LEGENDA			
<span style="border: 1px solid red; display: inline-block; width: 10px; height: 10px;"></span> ZDER Pura 58103,678m <sup>2</sup>	<span style="border: 1px solid orange; display: inline-block; width: 10px; height: 10px;"></span> Outras Construções	<span style="border-bottom: 1px solid green; display: inline-block; width: 10px;"></span> Mato	<span style="border-bottom: 1px solid blue; display: inline-block; width: 10px;"></span> Ribeira
<span style="border: 1px solid red; display: inline-block; width: 10px; height: 10px;"></span> Habitação Unifamiliar	<span style="border-bottom: 1px solid blue; display: inline-block; width: 10px;"></span> Limite Superior Escarpado	<span style="border-bottom: 1px solid red; display: inline-block; width: 10px;"></span> Entrada	<span style="border-bottom: 1px solid yellow; display: inline-block; width: 10px;"></span> Outros Cambios
<span style="border-bottom: 1px solid blue; display: inline-block; width: 10px;"></span> Muro de Pedra Alta	<span style="border-bottom: 1px solid blue; display: inline-block; width: 10px;"></span> Linha de Água	<span style="border-bottom: 1px solid red; display: inline-block; width: 10px;"></span> Limite Inferior Escarpado	