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NON-TECHNICAL SUMMARY

of Environmental Social Impact Assessment Report

Karavasta 140 MW Solar Project, Albania

August 2022

Tirana, Albania

REPORT SUMMARY

PROJECT TITLE	**KARAVASTA 140 MW SOLAR PROJECT, ALBANIA Karavasta Solar sh.p.k. established by Voltalia Ltd.**
DOCUMENT TITLE	**Non-Technical Summary Report of Environmental and Social Impact Assessment (ESIA)**

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FINAL PURPOSE OF ISSUE

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Abbreviations

AP	Affected People
AU	Administrative Unit
BAP	Biodiversity Action Plan
BMP	Biodiversity Management Plan
CCTV	Closed-Circuit Television
CESMP	Construction Environmental and Social Management Plan
CH	Critical Habitat
CHA	Critical Habitat Assessment
CIP	Community Investment Plan
CLO	Community Liaison Officer
CTMP	Construction Traffic Management Plan
DC	Direct current
DCM	Decision of the Council of Ministers
EBRD	European Bank for Reconstruction and Development
EC	Electrical Conductivity
EMF	Electromagnetic Fields
EPC	Engineering, Procurement and Construction
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMF	Environment and Social Management Framework
EU	European Union
GBVH	Gender-Based Violence and Harassment
GW	Giga Watt
H_2S	Hydrogen Sulfide
HH	Household
HV	High Voltage
IBA	Important Bird Areas
ICH	Intangible Cultural Heritage
IFC	International Finance Corporation
IPP	Independent Power Plants
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
KW	Kilo Watt
LRP	Livelihood Restoration Plan
MTE	Ministry of Tourism and Environment
MW	Mega Watt
NEA	National Environmental Agency
NICH	National Institutes for Cultural Heritage
NTS	Non-Technical Summary
OHL	Overhead Line
OHSMP	Occupational Health and Safety Management Plan

OST	Transmission System Operator
PBF	Priority Biodiversity Features
PDA	Project Development Area
PR	Performance Requirement
PS	Performance Standard
PV	Photovoltaic
RLMP	Recruitment and Labour Management Plan
SCADA	Supervisory Control and Data Acquisition
SEP	Stakeholder Engagement Plan
SO_2	Sulfur Dioxide
TL	Transmission Line
TW	Terawatt
WMP	Waste Management Plan

1. Introduction

Karavasta Solar sh.p.k (established by Voltalia S.A) is the Developer for the proposed 140 MW Karavasta Solar photovoltaic (PV) plant located in the Divjaka and Fier municipalities of Albania. Albania has a considerable potential for producing electricity from renewable energy resources and this Project represents an important milestone for the country.

Figure 1. Project location

The European Bank for Reconstruction and Development (EBRD) has categorized the Project as "A" in terms of its 2019 Environmental and Social (E&S) Policy, as it was considered that this Project could result in potentially significant adverse environmental and/or social impacts, and therefore a comprehensive Environmental and Social Impact Assessment (ESIA) and review of associated documents must be carried out, followed by their public disclosure for a minimum period of 120 days. Furthermore, IFC has also categorised the project as "A" due to 'potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented from the project' [1]

The Ministry of Tourism and Environment (MTE) has confirmed that the project is considered to be covered by Annex 1 under Decision of the Council of Ministers No. 686 dated 29.07.2015 (amended) on Environmental Impact Assessment Procedure and categorised as requiring an in-depth by ESIA. This document is a Non-Technical Summary (NTS) that explains in a non-technical language, the Project and its associated environmental and social benefits and impacts, relevant mitigation measures considered as well as engagement efforts. The information in this document is based on the outcome of the Environmental and Social Impact Assessment and associated studies prepared for the Project by Abkons, an independent consultant, on behalf of Voltalia S.A. This summary also informs on the means available to the interested public to access additional information and provide feedback on the project to the Consultant (Abkons sh.p.k), Karavasta Solar sh.p.k and Voltalia S.A.

For any questions, complaints or concerns about the Project in general, or for the ESIA report, or to receive further information, please contact Karavasta Solar sh.p.k through the contact details stated below.

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[1] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/es-categorization

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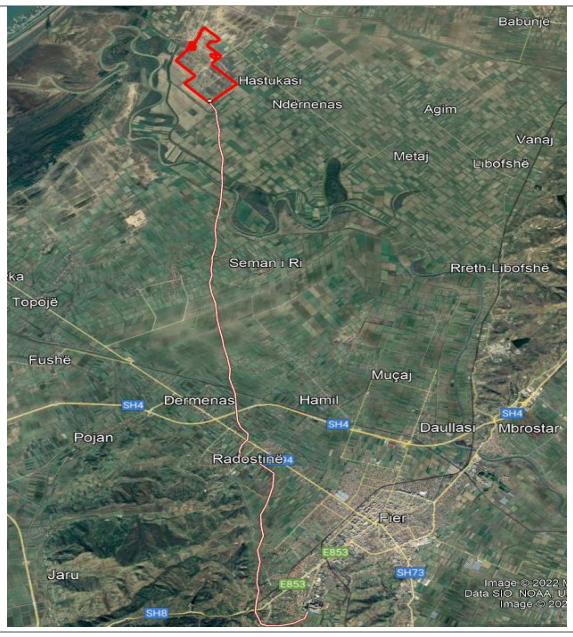
2. Background

2.1.1 Project Summary

The Project Karavasta 140 MW is located at Administrative Unit Remas – Divjaka Muncipality , and Administrative Unit Libofsha, Fier Muncipality. The Project Karavasta 140 MW includes construction of the PV plant and Overhead Transmission Line (OHL) 220 kV. The associated 220 kV overhead transmission line (OHL) will run approximately 19.2 km in a south-easterly direction from the Project site to the Fier substation, connecting the PV Plant to the national grid.

Installed capacity	140 MW peak
Asset type	IPP
Concession	30 years
Location	Fier
Available land of PV site	196 ha
PV plant footprint	185 ha
Performance Ratio	85%
Yield (P50) / (P90)	271 / 246 GWh//y
OHL	19.2 km
Connection point	PV site substation to the Fieri Substation



2.1.2 Why is the project needed?

The Albanian Government is working towards a reliable and more sustainable energy sector, development of which will be based on exploiting all energy options to meet Albania's energy demand and create added value for Albanian citizens, in alignment with the principles of environmental, economic and social responsibility. Historically, electricity has been generated almost exclusively by hydropower plants. In 2017 the country had a total installed capacity of approximately 2,100 MW of which 100 MW was thermal. In 2017 annual electricity consumption was about 7.1 TWh with a peak load demand of 1.4 GW. Albania also imports electricity from neighbouring countries.

Albania is a country, that in certain zones, has an average of 360 days of sun radiation and therefore electricity production from PV is an important potential source of electricity that will help in the diversification of energy sources and reduce its dependence on hydro and imported electricity.

Other project environmental and social benefits include:

- **Employment:** Employment possibilities for local residents is a priority for the Investor. The Project will create job opportunities, especially for the communities close to the project. It is expected that at the peak of construction activities, approx. 200 workers will be needed for the construction of the PV and OHL. At a local level, employment opportunities will mainly be for semi-skilled and unskilled workers and Voltalia will maximize the efforts to employ local workforce. Real percentage to be

confirmed when subcontractors has started the activity; . The number of workers on-site will build up over time until peak construction activity is reached and then will start to tail-off as construction nears completion and the Project enters the commissioning phase. It is expected that the construction period will begin towards third quarter of 2022 and last around 19 months. During the operation phase the employment opportunities will be limited compared to the construction phase.

- **Contribution to the Local Economy**: Where possible local goods and services will be used for the Project. For example, a portion of the equipment and vehicles to be used during the construction activities will be acquired from the region, and this will have a positive impact on the local economy.

2.1.3 What is the legislative framework of the project?

The ESIA has been undertaken in accordance with the main Albanian legislation requirements presented below and EBRD Environmental and Social Policy (2019) and associated Performance Requirements (PRs) as well as IFC's Environmental and Social Performance Standards" (PS).

Table 1. Legislative framework

Legislation	Overview	Relevance to the Project
Law No. 10431 (09.06.2011) Amended	"On Environmental Protection" (as amended) – This law establishes the environmental protection framework, institutional framework and competencies, environmental impact assessment principles and environmental permitting. The law is based on European Union principles and best practice toward environment management.	It requires that an Environmental impact Assessment is conducted and an environmental permit obtained before initiating the Project. The project, which the project has implemented. It establishes monitoring requirements to identify project impacts during construction, operation and rehabilitation, as well as requirements during the project closure phase.
Law No. 10440 (07.07.2011) amended	"On Environmental Impact Assessment" (as amended) - sets the principles, determines the project categories with environmental impacts, and establishes the responsibilities and rights of institutions and public in the procedure. The law determines the competencies of National Environmental Agency (NEA) and Ministry of Tourism and Environment (MTE) in the procedure, review of Environmental impact Assessment report and final approval.	Referring to the requirements of this law, an Environmental impact Assessment report was drafted
DCM No. 686 (29.07.2015) Amended	"On the rules, responsibilities, timelines for the Environmental impact Assessment procedure and the transfer procedure of the decision for the environmental declaration" amended - The act sets specific and detailed rules for the procedure, framework and structure of Environmental impact Assessment report and appendices, timeframe of the procedure, application for approval, final decision and impact monitoring and reporting during the project execution.	The content of the Environmental impact Assessment report is based on the requirements of this Decision.

Legislation	Overview	Relevance to the Project
DCM No. 247 (30.04.2014)	"On the determination of rules, requirements and procedures for public information and involvement in the environment decision-making process" - The act sets specific requirements for consultation with stakeholders, focusing on consultation with local communities. It also gives details on the procedure to be followed, timeline and media publishing.	Pursuant to the requirements of this decision, in the drafting phase of the Environmental impact Assessment report, consultations were conducted with stakeholders.

2.1.4 Public consultations and disclosure and dealing with objections

The Project stakeholder engagement process began in September 2020. The process started at the national level (incl. Ministries and National Agencies) and was followed by engagement at the Regional and Local Level (Regional directories, Municipalities, Administrative Units, etc) and at Community level.

During the initial consultation phase (scoping phase), 18 meetings took place with all levels of stakeholders, including engagement with 10 national institutions, 3 Non-Governmental Organisations, 7 regional and local institutions and 2 villages.

Preliminary Stakeholder Information (November 2020– February 2021): The draft Scoping Report, which set out the proposed scope of the ESIA process to be undertaken, was published on 14th January 2021 and made available through the project website for comments and suggestions for a period of 30 days until 12th February 2021, after which an online consultation meeting was organized on 26th February 2021 to discuss the Scoping Report and its preliminary findings. In total 7 participants participated in the meeting, including 1 national level, 2 regional and local level and 4 Non-Governmental Organisations.

Furthermore, during the ESIA study phase a socio-economic survey was undertaken which also served as an information campaign where the team distributed leaflets to the 364 households interviewed.

Stakeholder Engagement during the Environmental Impact Assessment according to the Albanian legislation – March – July 2021: A Public Hearing event was organized next to the school in the village of Ndërnenas, Fier on 30th March 2021, with local communities and several regional and local institutions (representatives of Regional Environmental Directorate, Municipalities, National Agency of Protected Areas, etc.) who attended the consultation meeting.

Furthermore, during this period the following authorities presented their opinion:

- National Environmental Agency;
- National Agency of Protected Areas; and
- Ministry of Tourism and Environment.

2.2 Project Description and Location

The proposed Project is located within Libofsha administrative unit, municipality of Fier, Albania and lies approximately 5 km south of the Karavasta Lagoon. The available land for the Photo Voltaic Project is **196 Ha** with the proposed layout footprint occupying a total of 185 Ha of land. The Project site is situated between the villages of Ndërmenas and Hasturkas to the East, the villages of Adriatik and Metaj to the Southeast and the Karavasta Lagoon to the North. The associated 220 kV overhead transmission line (OHL) will run approximately 19,2 km in a south-easterly direction from the Project site to the Fier substation, connecting the Plant to the national grid. Figure below shows Project area, the associated OHL location and the Area of Influence.

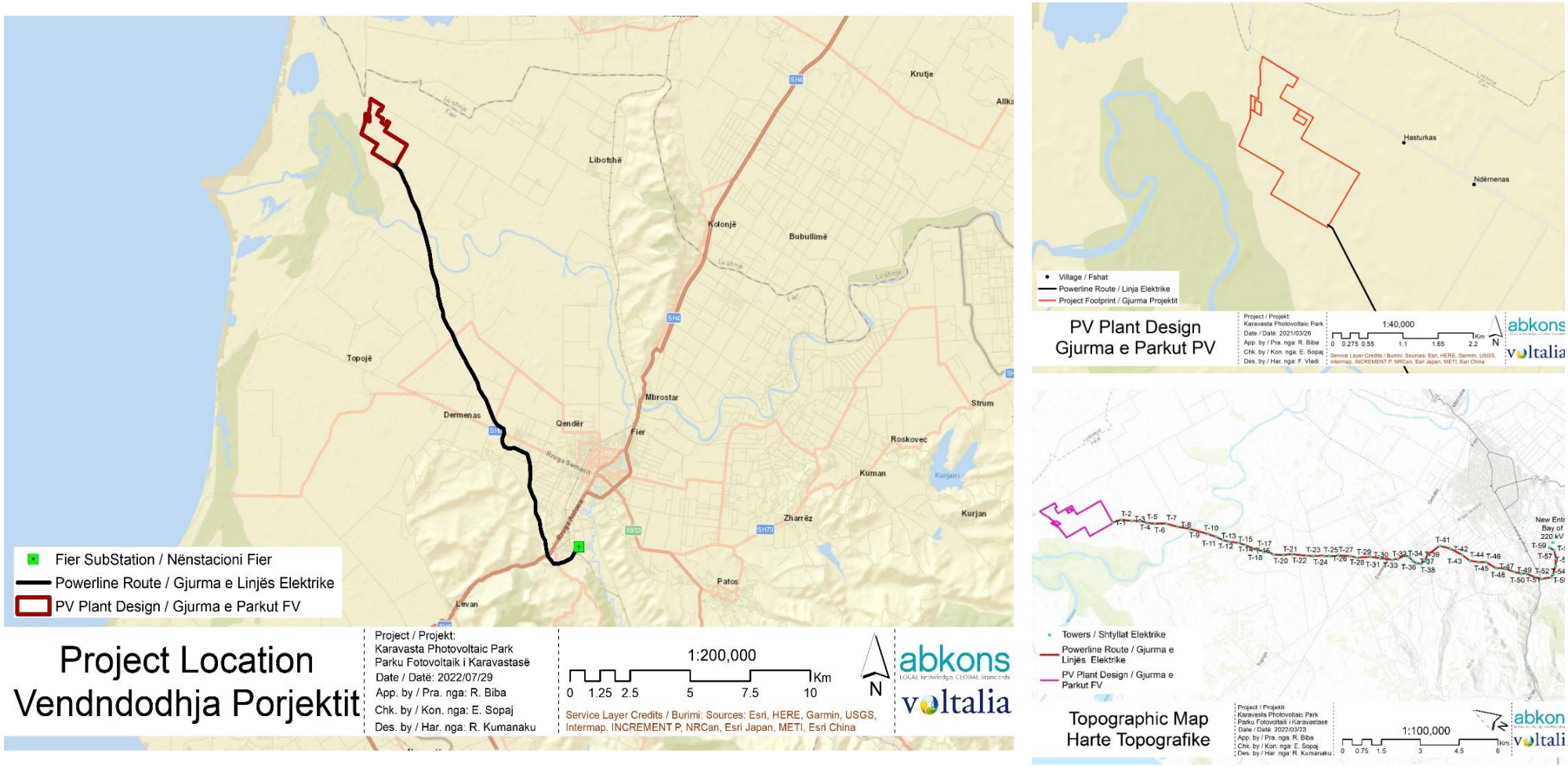


Figure 2. Plant and Over Head Line Project location

2.3 Description of the main Project Components

The Project is designed as a 140 MWp Direct current horizontal single-axis tracking photovoltaic park and will deliver 120 MW Alternating current) to the grid.

The figure below gives an overview of a utility scale grid-connected solar PV power plant; the main components include:

- **Solar PV modules**: These convert solar radiation directly into electricity through the photovoltaic effect in a silent and clean process that requires no moving parts. The PV effect is a semiconductor effect whereby solar radiation falling onto the semiconductor PV cells generates electron movement. The output from a solar PV cell is DC electricity. A PV power plant contains many cells connected together in modules and many modules connected together in strings to produce the required DC power output. The current design has a total of 241,400 PV modules, each generating up to 580 W; the final number of PV panels may vary from this figure based on the finalised layouts.
- **Module tracking systems**: These allow PV modules to be securely attached to the ground on tracking frames. The selected tracking system for the Project is a horizontal single axis tracker (North-South orientation) with the PV modules rotating from East (sunrise) to West (sunset), with a rotational angle of ±50° (see Figure 3 below). The purpose of the tracking system is to maximise the yield of the Project by increasing the time PV modules face the sun at their optimum angle, from the early hours until the end of the day, significantly increasing the electricity generated compared to fixed structure systems.
- **Inverters**: These are required to convert the DC electricity to alternating current for connection to the utility grid. Many modules in series strings and parallel strings are connected to the inverters. The Project will require a total of 32 inverters.
- **Step-up transformers**: The output from the inverters require a step-up in voltage to reach the Alternating current grid voltage level. The step-up transformer takes the output from the inverters (600 V) and initially steps this voltage up to 220 kV which will be collected and stepped-up again at the Project sub-station to the required grid voltage of 220 kV.
- **The grid connection interface**: This is where the electricity is exported into the grid network. The substation will also have the required grid interface switchgear such as circuit breakers and disconnects for protection and isolation of the PV power plant, as well as metering equipment. The Project will connect to the Albanian National Grid at Fier Substation located approximately 19.2 km southeast from the Project Site via a 220 kV overhead transmission line.

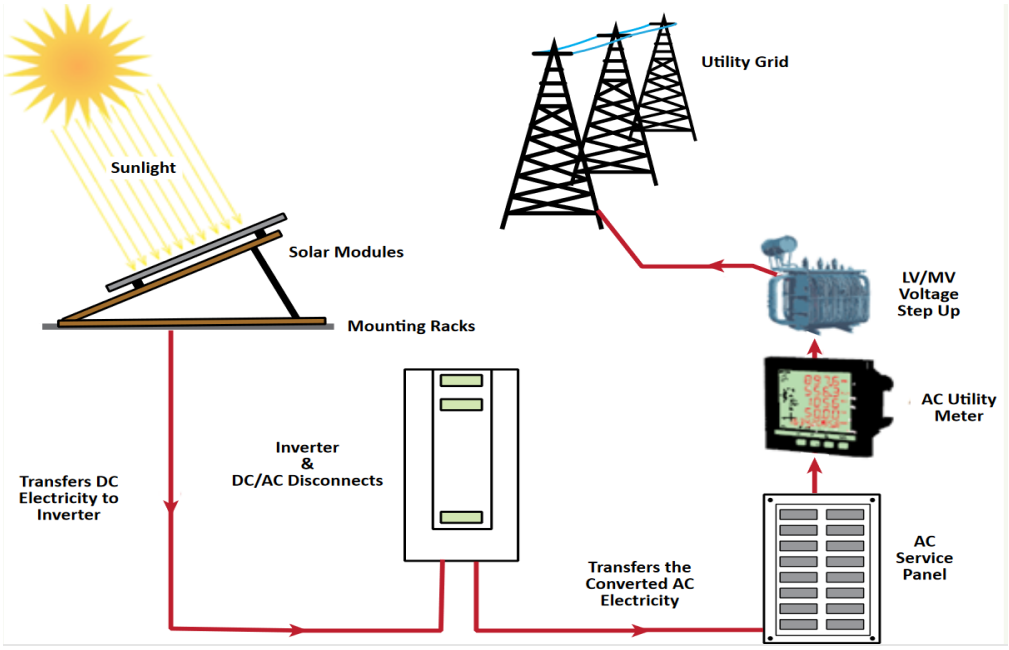


Figure 3. Overview of Utility Scale Solar PV Plant (IFC, 2015)

The Project will also require a building to accommodate the SCADA (Supervisory Control and Data Acquisition) equipment for the command, control and protection of the Project. This will be manned by the technicians employed for the control, operation and maintenance of the Project.

In addition to the above key components a large-scale solar PV project also requires the following infrastructure:

- Onsite (buried) cabling;
- Fencing and security measures;
- Access tracks;
- Material storage facilities.

During the construction phase, one or more temporary construction compound(s), including site offices, material and equipment storage etc., will be required as well as temporary roadways to facilitate access to all parts of the Development site. The privete plots inside PV area will be rented has been included with reference to the LRP which provides more detail on how the land parcels are being dealt with.

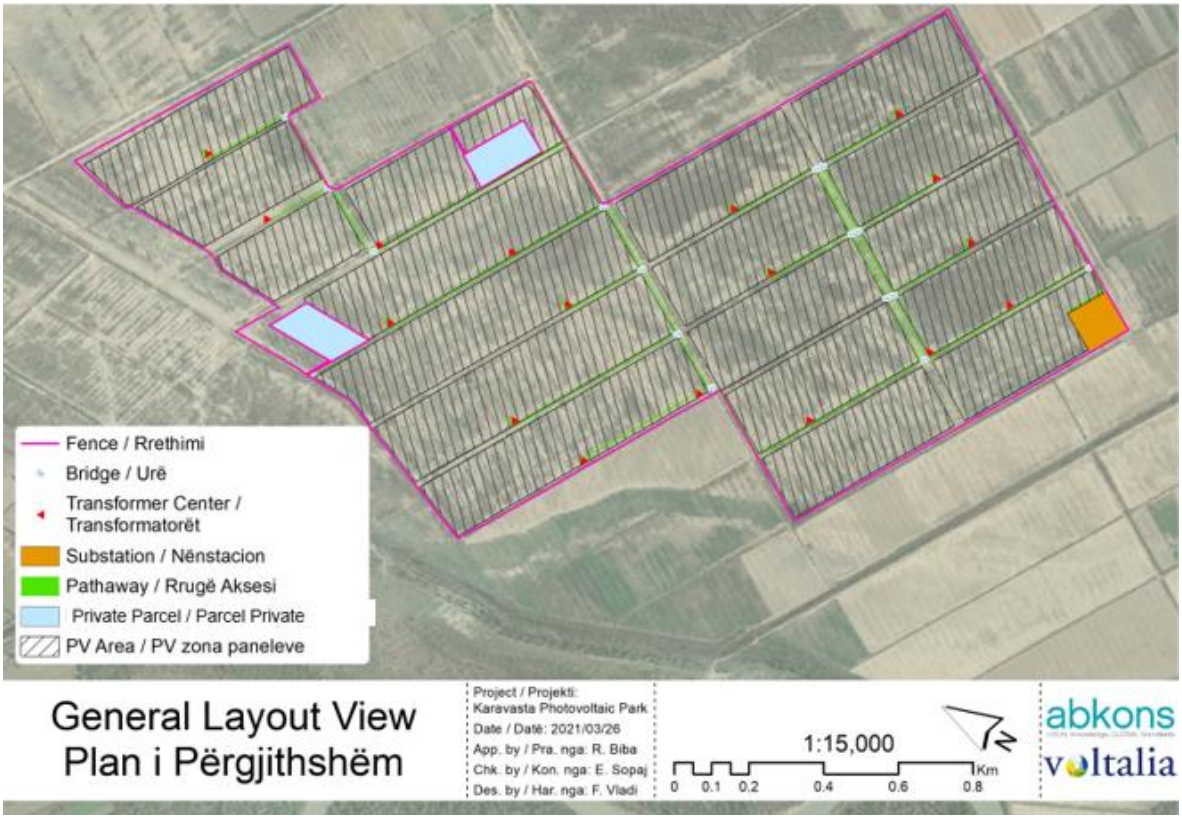


Figure 4. The PV Plant Project Layout including

2.4 Road infrastructure and access

Existing roads will be used to access the Plant Site. During the Plant Site construction phase, parts of the existing route may require widening and related civil works (e.g., bridge strengthening) for key components to be transported to the Plant Site.

The main entrance to the PV plant is represented by road paths in very bad conditions, sometimes difficult to access due to mud during storm periods. Road widths varies from 3-5 meters. Along the access roads to the entrance of the PV plant there is an old bridge, that is depreciated and risks to collapse. This bridge cannot afford the passage of heavy vehicles such as trucks, concrete machineries or any other heavy tonnage vehicles.

Along with interventions for improving road and bridge conditions for the PV plant site, a series of temporary roads will need to be improved or built for the installation of the OHL towers and line. The majority of these

roads are existing “agriculture roads”, that allow farmers to reach their respective parcels. An evaluation of the actual conditions of these access roads and the necessary upgrades and improvements have been carried out by Voltalia in December 2021. These agriculture roads will return to their existing conditions once the OHL has been installed.

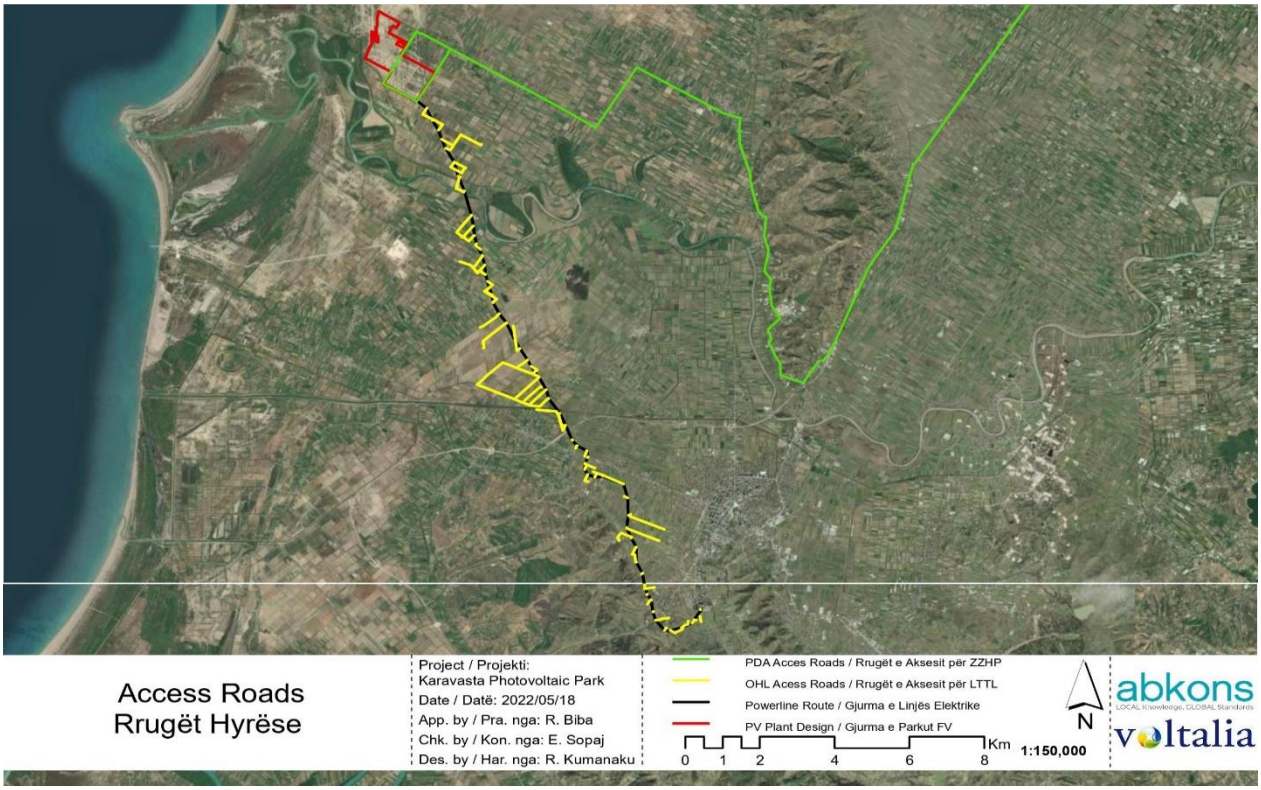


Figure 5. Access roads

2.5 Project schedule

The construction of the Project is planned to commence with Plant Site early works in Quarter 3 of 2022, and be in full operations in second half of 2023. The expected duration of the Plant Site construction period consists of 2 months early works, and 11 months construction. The final construction schedule will be specified during the detailed design phase.2.5.1 Overhead Transmission Line (OHL)

The Project requires a 220 kV overhead transmission line (OHL) to connect the Project to the National grid. This will be achieved via 19.2 km OHL connecting the Project to the substation located in the suburban area of the city of Fier; the proposed OHL route lies within the county of Fier and the Administrative Units of Fier Municipality.

All interconnection infrastructures shall be designed to ensure continuity of operation under all working conditions at the site as the first consideration and to facilitate inspection, maintenance and repairs.

The Right of Way (RoW) required for the line will be 25 m on each side. The RoW will serve as a corridor in which the project workers will use as temporary access (for several days) during the construction of the OHL to carry out the construction works.

2.5.2 Towers

Towers to support the OHL will be made of galvanized steel, lattice type, provided with six cross-arms (three on each side, in a vertical plan), suitable for mounting of two-three-phase power lines. The height of the towers varies from 25 to 30 meters.

It will be installed electric hazard signalling boards containing warning information, technical information and the telephone number of the entity responsible for operating and maintenance.

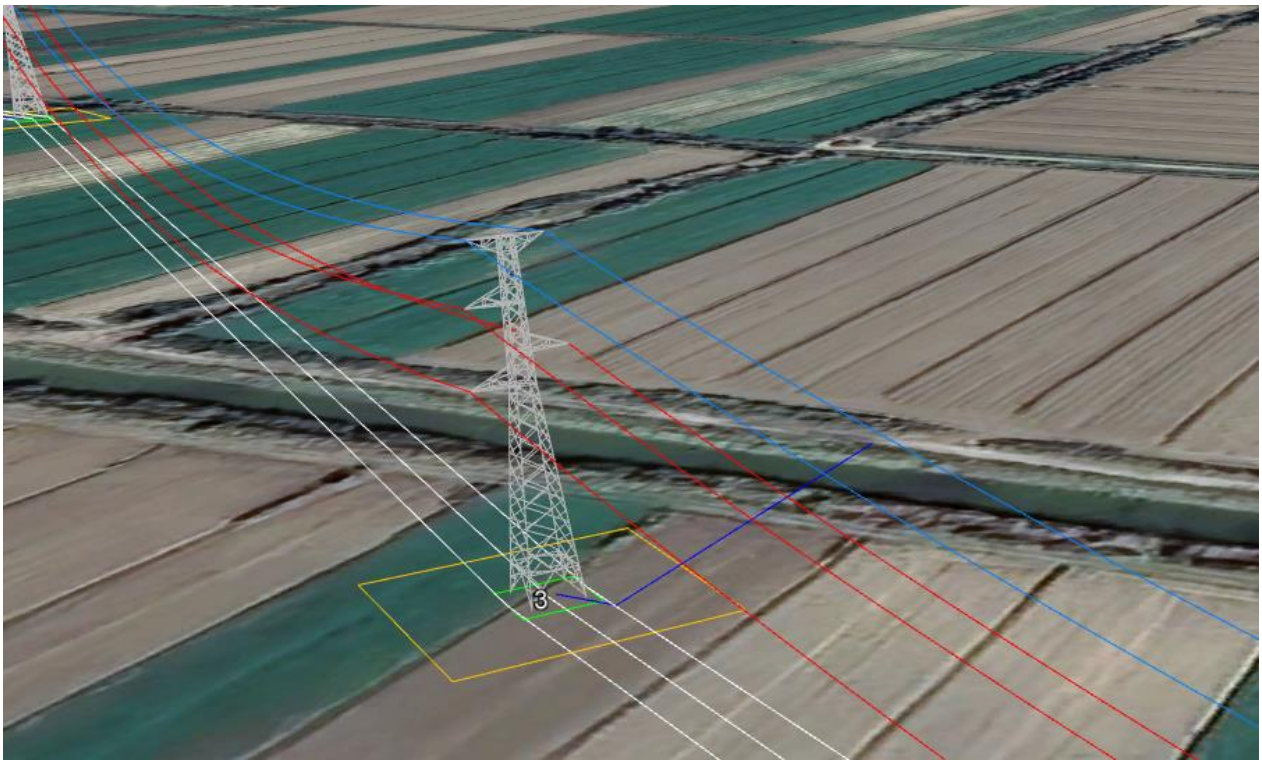


Figure 6: An image of the tower

2.6 Overview of Project Phases and Activities

The development phases for Karavasta Solar PV project can be categorised as follows:

- **Mobilisation/Pre-construction:** such as site preparation, mobilisation of equipment and materials to site.
- **Construction and Installation:** including civil works, electrical works, and equipment installation.
- **Operation:** Plant operation and routine maintenance.
- **Decommissioning:** Dismantling of equipment and associated facilities and site restoration.

The proposed total capacity of the PV plant is 140 MW and it is proposed to be built in a single phase. Construction of the Project is planned to commence in Q3 2022. Electricity generated from the project will be exported via power lines to the nearby substation for transmission and distribution via the national network, construction of which is planned to occur in parallel with the PV element of the Project.

Potential environmental and social impacts can result as a consequence to activities undertaken during construction, operation and decommissioning phases; key activities during these phases are summarised in the sections below.

2.6.1 Construction and Installation Phase

The construction phase of the project will include many activities and phases, such as:

- Construction/improvement of internal and external access roads;
- Levelling off the ground;

- Fencing around the site;
- Installation of PV Power Units;
- Pile driving for mounting structure;
- Construction of electrical substation and foundations;
- Excavation, trenching and cable laying;
- Fixing and wiring of the panels;
- Installing CCTV (if applicable) around the fence line and access points;
- Installing water tank for staff and O&M activities;
- Installation of septic tank;
- Construction of buildings;
- Erection of overhead HV power lines;
- Installation of Overhead Power Line;
- Testing and commissioning of equipment and the project as a whole; and
- Site clean-up.

OHL Transmission Line

The overhead transmission line (OHL) will be supported and guided by pylons connecting the Project to the Fier substation. The construction of the transmission line will be undertaken in the following sequential steps:

- Preparatory work:
- Micro-siting and finalisation of the locations of towers and route of OHL;
- Mobilisation of engineering machinery on the OHL route;
- Construction of platforms for pylons and delivery of materials along the OHL route;
- Construction work:
- Marking out of foundation, earth works and excavations;
- Installation of foundations and grounding devices;
- Assembly, installation, alignment and fixing of pylons;
- Installation work:
- Rolling out and connecting wires and cables, lifting them onto pylons, stretching and fixing on pylons;
- Installation of vibration dampers and remote spacers, mounting loops.

2.6.2 Operations and Maintenance

Once the facility is complete and operational, it is expected that it will have a lifespan of approximately 30 years.

Due to the passive nature of solar PV plants, there are no emissions and very limited waste generated during the operation of the project, no significant noise generating equipment or machinery, and limited need for hazardous materials to be stored on site.

2.6.3 Decommissioning and Closure

During decommissioning, the site will be returned to close to its original state. The components of a PV plant have an intrinsic value either for re-use or recycling. Decommissioning is expected to take between 6 and 12 months.

3. Summary of E&S baseline conditions

3.1 Physical Environment

This section presents the physical baseline of the project area under the following headings:

- Climate and meteorology;
- Air quality;

- Noise in the Project Area;
- Geology;
- Soils;
- Hydrology; and
- Topography and Landscape;

Baseline data has been collected based on desktop research of available information (secondary data), as well as primary data collected for air quality, noise, soils, surface water and groundwater, as part of field studies undertaken in the Project area between January- February 2021.

3.1.1 Climate and Meteorology

The climate is typical Mediterranean, Maximum and minimum temperatures are observed in August (maximum) and January. The climate zone conditions play an important role in how the area has developed and in the formation of special phenomena, such as:

- The presence of a characteristic flora and fauna throughout the year;
- The presence of a number of diverse habitats located in this region, and hence relatively high biodiversity;
- Rich offers of climate potentials for recreational and tourism development;
- Intensive agricultural activities development during the year (on suitable land).

The local climatic conditions impact on community life is significant especially during the summer when agricultural activities rely on artificial watering techniques.

3.1.2 Air Quality

This is a rural area with limited emission sources and therefore a generally reasonable air quality in the area. However, the data obtained from the air quality monitoring did show levels above the EU and Albanian norms for air pollutants like SO_2 and H_2S. This higher level of SO_2 could be attributed to the oil industry present in region and from house heating systems in village. All the villages use oil or wood for heating. Furthermore, during the site visit we identified an informal waste disposal, where wastes were burnt during the night. The main sources of air pollution near the project area are from transport vehicles used in the area, such as tourists and local residents. These activities generate dust (particulate matter) and noise. Air pollution from vehicle traffic is currently unmeasured. The poor condition of the roads, particularly in rural areas, can create large quantities of dust, especially in the dry periods (summer months).

3.1.3 Noise in the Project area

Along the project area the baseline noise environment does not vary significantly as it extends through uncultivated and undeveloped areas. Elevated noise levels are expected due to the following noise sources; vehicles traveling along the main road, agricultural activities, animals (dogs, chickens, and goats), village life and sporadic agricultural activities (use of pumps and rural vehicles), wind during the day and animals (dogs, chickens, goats during night). Sensitivity can be considered moderate to high in residential areas and in the vicinity of populated areas.

3.1.4 Geology

The geological profile of PV and OHL area shows that it passes through terrain composed of clay, silt, sand, not-cemented sand and peat. The project site belongs to the Plesistocene – Holocene alluvial – prolluvial sediments. In terms of sedimentary rocks these formations consist of composed of clay, silt, sand and peat.

This is an area that has no slippage and erosion as it is a flat surface but is problematic due to the low durability in construction as the sand itself does not support large reinforced concrete structures.

3.1.5 Soils

The main soil types found in this study are Saline, Alluvional/sandy and Divjaka hill soils. Salty lands which dominate the PDA are presented with a clear profile, formed under the conditions of rare natural vegetation, mainly halophytes. Salt comes from the sea water in these soils through capillary raise. Salted soils during the summer dry up and drain in different degrees. These soils have a high percentage of Na+ ions and low biological activity. The soil texture is dominated by clays (> 40%) and silt (20-40%). The percentage of sand is less than 15% giving the soil clayey, sticky and unstructured characteristics;

- On the east and northeast part are identified semi-salty soils that have low and very low agricultural potentials. These are heavy soils: up to 50% clay, 33% sand and 16% silt. Soils of the Divjaka hills (out of the PDA) are shallow soils, leached, reddish and with a developed profile. They are characterised by an average fertility and are appropriate for fruit trees, especially olive trees.
- There are identified two types of soils along the OHL route: Fluvisol (Eutric/Vertic Fluvisol[2]) and slightly saline clay soils (Salic Fluvisol[3]). The soils of the first group are generally soils with high agronomic fertility while the soils of the second group due to the presence, although low, of salt (sodic) and clays, possess low agronomic fertility.

3.1.6 Hydrology

The Study Area (200 ha) is located in the West of Albania (40°50'56.44''N Latitude and 19°27'12.5''E Longitude) close to the Adriatic coast (about 4 km). The nearest cities are Fier about 16 km, and Divjaka about 19 km and the nearest village is Hastukas about 2 km. Regarding the water stream, Study Area is situated between South Drainage Canal and the Semani River in South-Southwest, Myzeqe Drainage Canal, and Karavasta Lagoon in the North, drainage canals and Adriatic coast in the West, and drainage canals in East. The project area drains northwards towards Dokollarëve Drainage Canal, and ultimately to the Karavasta Pumping Station which discharges the water into the Adriatic Sea.

The irrigation-drainage system in the project area comprises the first, second and third drainage and irrigation channels, of which the Terbufi and Myzeqe emissaries are the main ones in the region. The Karavasta e Vogel area, Divjaka - Karavasta area and former swamp area of Terbuf were liberated from water due to improvements made during the period 1946 -1983 and protective embankment along the river banks.

There is not a typical alluvial aquifer in the plain area on either side of the river Semani.

3.1.7 Flooding

The project itself is situated below sea level and near a flooded area. The PV Plant is situated within a significantly larger area with extensive, poorly maintained irrigation channels. The drainage and irrigation system, although present in almost all surrounding areas, is not working properly, and only a small portion of the agricultural lands in the area benefit from the well-functioning of this service. This is mostly due to the lack of maintenance of the drainage system throughout the years which has not been performed timely, and the channels are continuously filled with sediment materials that create blockages and do not allow for proper functioning.

The wider area is at risk from a number of different flood events, caused by the Seman river, drainage channel flooding, or surface flooding during intense rainfall. Due to the dynamic flood risk in the surrounding area, and the fragility of the drainage network as a result of poor maintenance. Improvements to the drainage network within the PV Plant will reduce flood risk during the operations phase.

The impacts from global climate change on the increase in flooding could influence the PDA area, although this is expected to be of minor concern. Previous studies (Pirazzoli, 1986) showed that there is an increase of in Adriatic Sea level that ranges from less than 1 mm/year to over 2 mm/year, but it also indicates an increasing trend due to climate change.

[2] Soil Atlas of Europe (2005). European Soil Bureau Network, European Commission, 128pp.
3 Soil Atlas of Europe (2005). European Soil Bureau Network, European Commission, 128pp.

All the Project area drains northwards towards Dokollarëve Drainage Canal, and ultimately to the Karavasta Pumping Station which discharges the water into the Adriatic Sea. Referring to the data collected for floods from the Seman delta[4] and sea level rise in the area, the project area has not been affected by floods for a period of 100 years and are not expected to have floods inside the PDA area.

The Project is located in a stable area and has sea flood defences and sandy dunes created by the accumulation area of the Seman River thus significantly reducing the risk of direct flooding from the sea and changes in sea level.

According to the hydrological report the highest flood depth resulted from the Rain on Grid model for the 24-hour storm hyetograph with a return period of 1 in 100 years when the pumping station is out of work. The flood depth arrives up to 85 cm. In this case, when the pumping station is out of work and the by-pass is blocked, the water cannot discharge to the sea and will be locked on the field. While the same storm and pumping station is working in full capacity the water depth is about 70 cm and it takes 4-6 days to dry out. For two other storms, 50 and 20 years return period water depth is 60 cm and 55 cm respectively. Flood velocities are below 0.6 m/s which is below the level that would require erosion protection. While the hydrodynamic modeling of the Semani River and the Myzeqe canal shows that the Study area is not prone to flooding. Within the area of inundation, the mounting height of the solar module frames should be designed such that the lower edge of the module is clear of the predicted 1 in 100 years flood level (pumping station is out of work) so as not to impact on existing flood behavior and to prevent the infrastructure from being damaged as a result of flooding. In the event of a significant flood event, the modules should be rotated to provide maximum clearance from the panels to the ground to keep them positioned well above the predicted flood level. All electrical infrastructure, including inverters, should be located above the 1 in 100 years flood level. Where electrical cabling is required to be constructed below the 1 in 100 years flood level it should be capable of continuous submergence in water

Climate change will impact temperature and irradiance and therefore will alter the output capacity of PV systems. PV systems present a negative linear relationship between the energy output and the temperature change, while the increase of solar radiation is proportional to the PV energy output.[5]

Sea level change was analysed by Pirazzoli (1986) and showed that there is an increase of the Adriatic Sea level that ranges from less than 1 mm/year to over 2 mm/year, but it also indicates an increasing trend due to climate change. For the period 1961 – 2003, the data show an average increase from 1.3 to 2.3 mm/year, while during the period 1993 - 2003 there was an average increase from 2.4 to 3.8 mm/year. At the World Climate Change Summit (ICCP 2007) it was reported that during 1980 -1999 and 2000 – 2099, the average sea level rise will range between 0.18 m - 0.59 m due to melting glaciers.

The rise of the sea level, causes changes of the coastline position and will have a very big impact on the lowlands near the sea and the deltas of the rivers. Measurements carried out at several stations in the Adriatic Sea during the period 1993-2014, show that the maximum (7.13 + -1.67 mm/year) value of sea-level rising of the Adriatic Sea is measured at Ravenna station (Italy), while the minimum (2.48 + -1.53 mm/year) value is measured at Zadar in Croatia.

3.1.8 Topography and Landscape

The main morphological elements developed in the Divjaka – Karavasta region are represented by a large plain area, the small hills of Divjaka located about 8.5 km northeast of Project site, and the coastal lagoon of Karavasta which lies to the northwest, the Seman and Shkumbin deltas to the southwest and northwest, respectively, and the sand dunes and sandy beaches to the west. The most important morphological features are related to the deltaic coastal Karavasta area to the northwest of the Project site, which are the result of the action of the wind and wave regime, sea currents, sediment discharges, etc.

[4] ICE-000-P06-V01 Karavasta 140MW - Hydrological Survey
[5] Jerez, S., Tobin, I., Vautard, R. et al. The impact of climate change on photovoltaic power generation in Europe. Nat Commun 6, 10014 (2015). https://doi.org/10.1038/ncomms10014
Wild M. (2012) Solar Radiation Versus Climate Change. In: Meyers R.A. (eds) Encyclopedia of Sustainability Science and Technology. Springer, New York, NY. https://doi.org/10.1007/978-1-4419-0851-3_448

Geographically the project site is part of the Myzeqe e Madhe (agricultural fields), which lie on the shores of the Adriatic Sea, in the central part of the Western Lowland; it is bordered to the north by Shkumbin River, to the south by Seman River, to the east by the hills of Divjaka - Ardenica and to the west by the Adriatic Sea. This geographical position is evaluated for facilitation of services and activities of the human community living in the municipality and its villages.

3.2 Biological Environment

The biodiversity assessment included desktop and field surveys of habitats, flora, invertebrates, fish, amphibians, reptiles, birds and mammals. In total, 352 vascular plant species were observed during the field surveys, around 100 species were under IUCN protected status, but none of them was found inside Project footprint. Survey of habitats in the project area has shown that there are no habitat types listed in the Annex I to the Habitats Directive.

The Project, including the PV solar plant and OHL route, passes through mixed Mediterranean landscape of agricultural, abandoned, meadows and pasture lands. Vegetation in the PV solar plant area is dominated by salt marsh habitat and meadow lands with low biodiversity values. The OHL route encompasses a larger area and a more diverse environment in terms of habitat diversity and biological species.

Around 34 species of mammals were observed in the wider study area. Presence of protected species like otters (*Lutra lutra*), badger (*Meles meles*), and golden jackal (*Canis aureus*) was confirmed within the PDA and adjacent drainage channels, including Semani river. Herpetofauna of the PDA and OHL is composed of 6 amphibians (out of 16 amphibian species recorded in Albania) and 23 reptiles (out of 43 species reported in Albania). Two frog species *(Rana dalmatina and Hyla arborea)* are Annex IV of EU HD, while one species *(Pelophylax shqipericus)* is an endemic species of Albania and Montenegro, Presence of 11 reptile species was confirmed.

The baseline studies revealed that a number of fauna species with protected status were observed within the wider study area. This includes eight (8) mammal species, four (4) reptile species and three (3) amphibian species.

A total of 125 bird species were observed in the project area, three of them are Globally Endangered, four species are endangered in Europe, while 19 species are endangered at national level.

In line with the requirements as per IFC PS6 and EBRD PR6 for Critical Habitat (CH) qualifying biodiversity, Priority Biodiversity Features (PBFs) and Karavasta Lagoon Key Biodiversity Area (KBA) and Important Bird and Biodiversity Area (IBA), a Biodiversity Management Plan (BMP) has been prepared to detail the mitigation and monitoring measures that will be implemented during construction and operation phases of the project to avoid and minimize impacts and restore habitat for these features on-site and verify the levels of impacts occurring.

A Draft Biodiversity Action Plan (BAP) has also been developed to quantify residual impacts on identified priority biodiversity and propose conservation actions that would support the project to meet its net gain commitment for CH, and no-net-loss commitment for PBFs, and promote conservation aims and effective management of Karavasta Lagoon KBA/IBA, also in line with recommendations by the BirdLife International.

3.2.1 Protected area

The project site is just outside the south-western tip of Divjaka-Karavasta National Park. This National Park is considered one of the most important natural areas in Albania. Divjaka-Karavasta National Park is 22,230 ha large. It has been designated as a National Park in 2007 through the Decision of the Council of Ministers (DCM) No. 687, dated 19.10.2007. The Park represented by the following major habitats:

- Forest area (forests, rare forests, alluvial forests and shrubs, reforestation, forest and aquatic vegetation land) 5,310.00 Ha;
- Agricultural area (agricultural land, orchards, olive groves and vineyards) 9,078.42 Ha;
- Aquatic area (lagoons, rivers and watersheds) 6,408.90 Ha;
- Non-productive area (sandy and bare) 1,120.71 Ha;
- Urban area of mixed farmland, orchards and woodland 312.21 Ha.

The Important Bird and Biodiversity Areas (IBA) of Karavasta lagoon and the Key Biodiversity Areas (KBA) of Shkumbin-Seman, covers major part of the National Park and is situated between the Shkumbini River in the North and the Canal of Myzeqe and Semani River in the South. The eastern part of the complex is surrounded by Divjaka hills while the western border is composed of the Adriatic Sea.

The Nature Managed Reserve of Pishe-Poro is a coastal wetland site situated north of Vjosa River and approx. 14.5 km south-west of the PDA.

"Vjose-Narta" was designated as a Landscape Protected Area by the Decision of Council of Ministers No. 680, dated 22.10.2004. It is located approx. 20 km south of the PDA. Designated as a natural monument III category of IUCN Protection in 2002[6], "Kurora e Semanit" represents an old riparian forest situated along Semani river.

The nature monument covers an area of about 44 ha distinguished for its high biodiversity, and is located 6 km southeast of the PDA and approximately 3 km east of the TL.

3.2.2 Critical Habitat

A Critical Habitat Assessment (CHA) was completed to provide a better understanding of the biodiversity features which potentially trigger IFC's Performance Standard 6 (PS6) and EBRD's Performance Requirement 6 (PR6). The analysis is based on interpretation of global and regional datasets, available literature and field data from the ESIA and the CHA. It confirmed that :

- Five species meet the Critical Habitat (CH) thresholds for Criteria 1-3 / Criteria ii-iv) in wetland and aquatic habitats within the PV plant and along the transmission line route - four fish species and the Albanian Water Frog;
- The remainder of the Project area meets the IFC definition of modified habitat – with the exception of a small area of Salix alba and Populus alba galleries along the Semani river between pylons 10-15 of the transmission line; These habitats also meet EBRD's definition of 'threatened habitat' and are considered PBFs. However, neither of these habitats have been determined to be threatened by the IUCN Red List of Ecosystems Assessment for Europe and therefore do not meet the IFC / EBRD definition of CH.
- Two habitats and 49 species are identified as PBFs, as defined by EBRD PR6;
- The Project footprint overlaps with an internationally-recognised area (Karavasta KBA). The KBA also meets the EBRD definition of PBF. The wetland habitats within the Karavsta KBA are CH for two bird species, however these habitats do not overlap with the Project area and PS6 / PR6 CH requirements do not apply to either Dalmatian Pelican or Pygmy Cormorant;
- The presence of species that qualify areas as CH does not necessarily mean that aproject will significantly impact these species.

[6] https://www.eea.europa.eu/data-and-maps/explore-interactive-maps/european-protected-areas-1

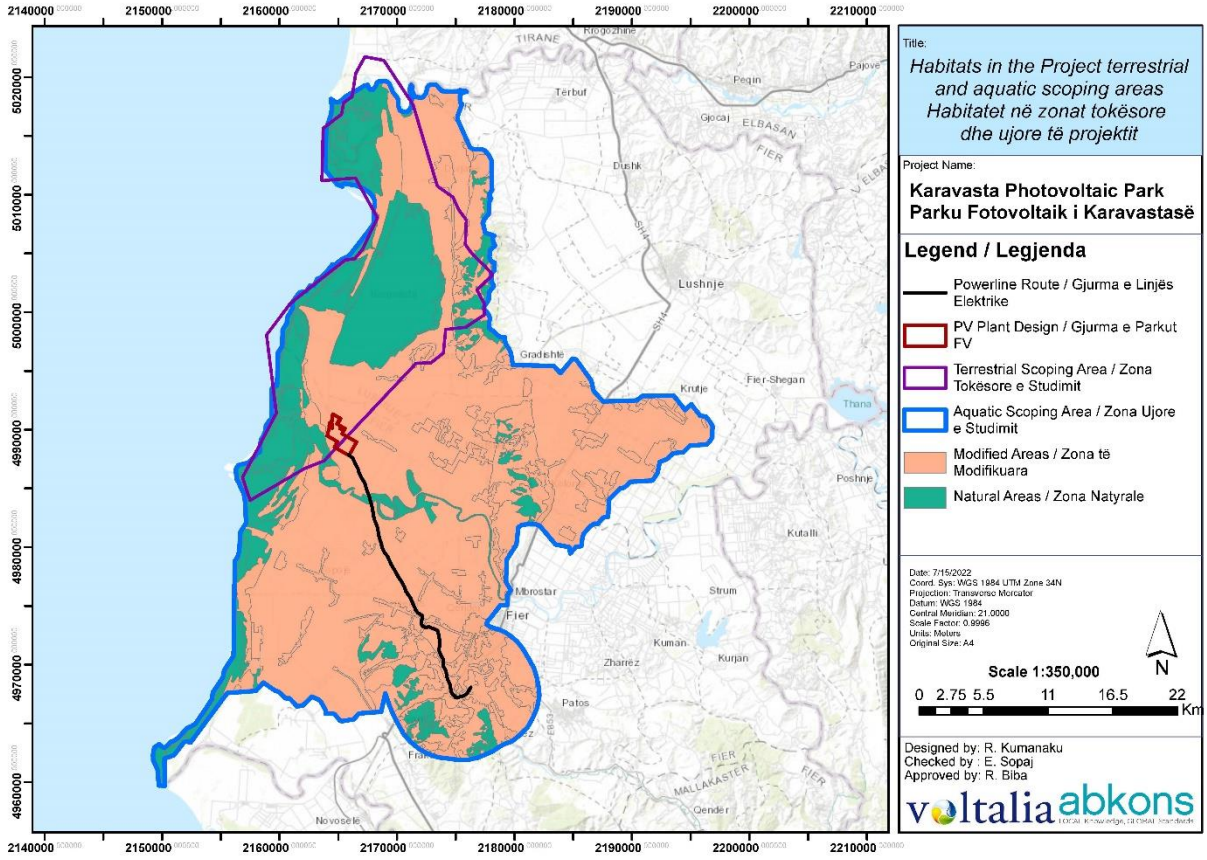


Figure 7. Natural and Modified Habitat in Terrestrial and Aquatic Scoping Areas

Mitigation of impacts in relation to habitats will be managed through the development of the ESMP and BAP, that will specify appropriate measures for the management of site clearance and excavation activities, training of staff for the preservation of biodiversity values, and soil and waste management both along the PV solar plant and OHL, as well as for associated infrastructure, such as base camp and any small length access/entrance roads, etc.

3.3 Socio-Economic Baseline

The closest villages to the PV plant are Hasturkas and Ndërnenas which lie around 800 m and 1500 m respectively to the east of the project area. While, the closest inhabited houses including some warehouses are located 40-50 m distance from the main entrance road that leads to the PV plant area and 390 m far from the PV plant itself.

The PV plant will be developed in territories of Libofsha and Remas AU`s while the OHL will intersect the territories of Topoje, Qendër and Dermenas AU`s. The direct project study area for the social baseline assessment includes the settlements near and within the PV plant and OHL affected area.

Comparing the data from Census 2011[7] and those actually registered in the Civil Registry[8], 38.54% less residents are registered in the Census for Fier municipality and 35.82% less residents for Divjakë municipality. This can be considered as a probable number of those who have migrated.

The population in rural areas significantly changed after 1990. Due to a lack of investment and possibilities for employment, large numbers of people left rural areas to find work in the cities.

The municipality of Fier includes the most important agricultural areas of the country, as well as a significant part of the industry related to oil refining in Fieri region. More than half of the population of the municipality live in rural areas, which shows the importance of the agricultural sector in the economic life of the

[7] INSTAT 2011 CENSUS http://www.instat.gov.al/
[8] https://aam.org.al/bashkia-fier/

municipality. The agricultural production of this area is diverse from cereals to vegetables, melons, livestock and its by-products. The municipality has a considerable coastline that stretches from the Vjosa River to the Seman River estuary at the borders of the Divjaka-Karavasta National Park. Also, an important touristic attraction is the Archaeological Park of Apollonia, along with other cultural heritage sites.

The municipality of Divjaka consists almost entirely of rural areas. The municipality is located in a completely rural and fertile area, while part of the territory of this municipality is the national park Divjaka - Karavasta, as well as the beach of Divjaka. Agriculture is the main economic activity. The main agricultural products are melons, which are sold in the domestic market and exported to many countries in Central and Eastern Europe. Divjaka has good prospects for the development of coastal tourism and ecotourism. In recent years bird watching has appeared as an important tourism attraction due to the presence of a small colony of endangered pelicans in the Karavasta lagoon. Tourism is developed mostly for day tourists and the cuisine is focused on fish products, for which the area is famous all over the country.

The economic activities of the project study area are mainly focused on farming. The data analysed for the project area shows that of the heads of family (considered as the main income provider) 46.4% are engaged in agricultural and livestock activities. Another 10% report being employed in the private sector, public sector, or self-employed and 34.6% of the respondents are retired pensioners. In addition, 7.4% of the respondents are unemployed and actively looking for a job.

Regarding the family members employment, farming is still the largest employer with 26.78%, compared to other sectors. When working as a farmer in the village, residents are mostly fulfilling their family's needs. The project area is characterized by a uniformly flat landscape with the absence of significant woodland or scrub cover. The land use is the broader Project area is almost completely dominated by crops, which present as a characteristic patchwork of rectangular fields. Parcels of land are also used for pasture by the farmers in the area due to the difficulty of planting crops in salty areas.

The PV plant project site itself is mostly saline due to its vicinity to the seashore and the infiltration of sea waters, and therefore is not used for growing crops. However, during the engagement in the village of Hasturkas it was reported that a small portion of the land is used for grazing but there are no specific users identified.

A total of eight potential ecosystem assessment (ESA)[9] have been identified along or in vicinity of the OHL route; these include:

- Livestock;
- Honey production;
- Capture fisheries;
- Hunting;
- Pollination;
- Hydrology processes;
- Ethical / Recreational and tourism; and
- Semi and natural habitats.

Following a screening process, the following five services were selected for a more detailed assessment:

- Livestock;
- Honey production;
- Hydrology processes;
- Recreational and tourism; and

[9] Ecosystem Assessment/Services are defined as "the benefits people derive from ecosystems". Besides provisioning services or goods like food, wood and other raw materials, plants, animals, fungi and micro-organisms provide essential regulating services such as pollination of crops, prevention of soil erosion and water purification, and a vast array of cultural services, like recreation and a sense of place.
Source : https://www.iucn.org/commissions/commission-ecosystem-management/our-work/cems-thematic-groups/ecosystem-services

- Semi and natural habitat.

Over ninety percent (90.4%) of the resident households (HH) cultivate their land, and profit crops for their family needs or sometimes even for selling. However, most crops are seasonal crops and this of course, brings unstable income. Respondent's report cultivating agricultural products at a rate of 69.1 %, while the rest is cultivated with crops for livestock purpose. With regard to livestock, 70.9 % of the HH reported that they own livestock.

Vulnerable people may be more adversely affected by the land acquisition process than others and who may be limited in their ability to claim or take advantage of compensation. In the context, the project especially for the land acquisition for the OHL, in evaluating the vulnerable people have included but not limited to;

- Disabled persons, whether mentally or physically;
- The elderly, particularly when live alone and/or have no networks of solidarity to support them;
- Households whose heads are female and who live with limited resources;
- Households who have no or limited resources;
- Widows and orphans;
- Households who are affected by the Project but whose ownership rights are not registered or otherwise supported by documentation, thereby putting them at risk of not receiving compensation (this may include informal tenants and sharecroppers, and other occupiers with no legal recognition); and
- Children residing in buildings along access roads or routes passing near local schools.

The screening and identification of the vulnerable people in terms of land acquisition have been defined in the Livelihood Restoration Plan (LRP).

Almost all encountered habitats within and in the vicinity of the PDA are likely to have been degraded to some extent through human modification. The intensive cutting, overgrazing, and intensive agriculture have led to a simplification of the landscape and a reduction in biodiversity, which have affected various ecosystem services, such as natural pest control and pollination.

Within the PV plant area there is a road path used by the villagers and herders during spring and summer time to provide access to the agricultural parcels at the other side of the PV plant. In addition, this path is used as a short route connecting the access road that leads to the coast. The road path is unpaved, muddy and impossible to drive by during and/or after rainy days. However, the temporal interruption of access to this path will not restrict residents from reaching the other side of the PV plant since they have other road alternatives.

Along with interventions for improving road and bridge conditions for the PV plant site, a series of temporary roads will need to be improved or built for the installation of the OHL towers and line. The majority of these roads are "agriculture roads", access roads that allows farmers to reach the respective parcels. Drinking water coming from the water supply is reported by the local residents to be unsafe and not used for drinking purposes.

In most of the villages there is primary and secondary schools, while the high schools are located in the bigger villages where the Administrative Units are located. Health centres provide basic first aid services. Most of them lack staff and equipment. The hospital is located in Fier City.

3.4 Cultural Heritage

No cultural heritage sites (tangible or intangible) have been identified within the Project area based on the available published literature including National Institute for Cultural Heritage website and site investigation, No Intangible Cultural Heritage were identified or reported from consultation and meetings with local communities, Key Informant Interview and municipalities, etc.). The closest cultural monuments with the PDA and OHL route are Kulla e Pirgut - First Category Monument, (621 m from PDA) and Church Shen Marines (686 m from PDA). There is also an orthodox church 1.2 km from the site, named as *Church of*

"Ungjillëzimi Hyjëlindëses" in Hasturkas. None of the local communities identified any significant traditional practices that could be affected.

3.5 Stakeholder Engagement

Stakeholder engagement activities to date were carried out as part of the ESIA process, to Albanian and Lenders' standards, and land acquisition and livelihood restoration process. All stakeholders have been engaged since the early stages of the project through individual meetings, distribution of leaflets informing about the project. Engagement has been undertaken during the scoping and ESIA phases and during the LRP study where all communities living along the route transmission lines have been extensively engaged and informed about the land acquisition process, but also about the impacts related to the Project. Additional meetings will be held for the LRP package disclosure.

This SEP methodology has been developed in order to outline the principles and methods that should govern Voltalia's engagement with all existing and potential stakeholders during all phases of the project. It has been determined that all relevant stakeholders would be invited to participate in a set of meetings, in various phases of the process, in order to be informed regarding the findings and recommendations of the study team. The main principles that will guide throughout stakeholder engagement are as follows:

Proactive: In order to avoid any potential risks that might. arise in our dealings with stakeholders.
Transparent: The Company will engage with stakeholders in an open process, with transparent purpose, goals, accountabilities, expectations and constraints.
Timely: The Company will engage with stakeholders in the advance of the consultation activities and decision-making, in order to allow sufficient time for meaningful dialogue, consultation and modifications.
Inclusive: The Company will ensure inclusiveness of our engagement with stakeholders in representation of views, including women, key informants and focus groups.
Accessible: The Company will disseminate information in ways and locations that facilitate the access of stakeholders to it.
Free: The Company's engagement with stakeholders will be free of any kind of manipulation, intimidation and coercion.

The stakeholder engagement process should begin at the earliest stage of project planning and continue throughout the life of the project, with a focus on:

- Engagement during project preparation/design (including disclosure) (Refer to 0);
- Engagement on the pre-construction and construction phase;
- Engagement during project operational; and
- Engagement during decommissioning phase.

Stakeholder Engagement Plan is published in the Project website:

https://karavastasolar.com/stakeholder-engagement-report/

4. Main Environmental and Social impacts and associated mitigation measures

The construction phase of large-scale solar PV plant and overhead transmission lines (OHL) generally represent the main impacts of such projects on the local environment and communities, due to the invasive nature of the activities required on site. The key impacts for the construction phase and associated mitigation measures are presented in the table below.

4.1 Construction phase

Table 2. Environmental and Social Components – Construction Phase

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
Air	Emission of pollutants due to combustion and exhaust emissions generated from the construction equipment, generators, vehicles and Project traffic. Generation of dust during construction works and vehicle movement.	Ambient air quality deterioration due to pollutants emissions.	Development and implementation of the CESMP and dust management procedures, that will include appropriate measures for the management of site clearance, excavation and construction activities to minimize the generation of dust and prevent its dispersion; - The most effective way to manage and prevent dust generation and vehicular emissions and traffic is through effective control of the potential dust generation sources; some specific mitigation measures to ensure that these sources are minimized are: - Stockpiling of soil and earthen material will be minimized by - proper coordination of earthworks and excavation activities - When there is visible dust being generated by vehicles and other activities, apply water sprinkling measures to reduce dust. - Develop a Construction Traffic Management Plan (CTMP) - All construction machinery and equipment to be maintained in good working order and not left running when not in use. - Observe dust levels and amount of dust settling on properties near (200 m) construction sites and take action to reduce dust generation if there is excessive dust on surfaces. -	***Minor – PV plant and OHL***

Soil	Excavations for foundations, backfilling and access road construction.	Disturbance of soil layer structure.	- Some of the mitigation measures related with the disturbance of soil layer structure are: Minimise the removal of topsoil and storage of top layer of fertile soil, followed by land re-cultivation and restoration after works implementation - Mitigation measures to prevent soil contamination are: - Regular maintenance of vehicles and machinery, - Implement good practice in use and storage of chemicals and management of wastes - Stockpiles will be located within designated soil stockpile areas - Stockpiles will be stabilised with matting, geotextile/ silt fencing or other appropriate controls if they are to remain bare for more than 3 months particularly during the winter in the rainy season. - Compaction of stockpiles will be avoided as this will hinder establishment of vegetation during rehabilitation / restoration. - Use all excavated materials within the site for landscaping and site restoration.	***Minor – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
	Spillage or leakage of oils and fuels from construction vehicles/ machineries, improper storage and management of waste oils/ fuels / chemicals/ wastewater, etc.	Contamination of soils.		
	Risks from surplus/spoil material due to excavations	Pollution of the environment from spoil material		
Hydrology	Excavations for foundations of the OHL towers and PV plant, Spillage or leakage of oils and fuels from construction vehicles and other machinery, Improper storage of waste oils, fuels and other chemicals and poor management of waste and wastewater at worker accommodation compounds.	Contamination of surface and groundwater with runoff from construction sites, and sedimentation and erosion within the PDA and drainage/ irrigation channels	- Implement of good practices in management of excavations, use and storage of chemicals and management of wastes. - Maintain the hydrological pattern and scheme around the PV plant site and areas of work for the OHL towers and kept disciplined to the maximum extent possible with the natural/ existing water flowing, channel depth and slope inclination; Develop an Erosion and Sediment Control Procedure;	***Minor – PV plant and OHL***
		Modification of irrigation and drainage patterns		***Minor – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
Landscape and Visual	Temporary excavation of the natural land; vegetation clearing; Temporary storage of construction material, machinery and temporary access roads, construction of the PV plant, OHL tower foundations and erection of towers	Temporary change to landscape and visual intrusion.	- Develop and implement good construction practices andhousekeeping (part of CESMP) to control construction activities and maintain clean working areas; - Minimize the removal of topsoil and limit to only those areas where is necessary; Judicious vegetation clearance to ensure only limited vegetation is cleared only within the project footprint areas to facilitate construction access and working activities; - Keep proper housekeeping in construction sites during all working activities; materials, wastes, and machinery to be contained within areas that are adequately fenced and equipped with signage;; - Rehabilitate and restore disturbed areas incrementally and as soon as possible, not necessarily waiting until completion of the construction phase; - Ensure continued consultation with local communities throughout the construction period.	***Minor – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
Noise and vibration	Pile driving for construction. Earth moving activity. Movement of construction vehicles. Access route construction. Construction activities for the PV plant. Erection of towers and conductors.	Noise nuisance.	- Equipment maintenance, and noise emissions monitoring, managed through the development of CESMP for the construction phase - Develop and implement the OHSMP for the protection of workers and equipment with adequate Personal Protective Equipment - Develop and implement the CTMP (see mitigation measures proposed for traffic management); - Prior notification of the local residents in case of important work activities that generate noise and/or vibrations; - Restriction of construction activities to daytime hours and weekdays.	***Minor – PV plant and OHL***
Traffic	Generation of construction traffic.	Community and workforce safety and local traffic flow.	- Develop and implement a Construction Traffic Management Plan (CTMP); - Implement road improvement where necessary - Notify through local government all the habitants on the affected areas to coordinate the traffic flow for the local users; - Engage with relevant authorities and local communities and landowners / land users prior to any change required for the access roads. - The transportation will be protected and patrolled by the crash trucks and possible police escort to guaranty the safety of other road users and to inform the respective authority for the overloaded trucks for the national road segment, Durres – Mbrostar, to be used also for the rural segment of Mbrostar – Libofshe – Agim – Ndermenas –Site or Babunje – Agim – Ndermenas – Site; - . - Training of drivers in road safety and code of conduct.	***Minor – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
			- Traffic Risk/Hazard awareness program specifically including children as a target audience needed to be developed - Consideration of phasing work to ensure local access retained. - Identify and install all necessary warning signage on public roads used by the project vehicles; - Traffic Risk/Hazard awareness program specifically including children and vulnerable people - Set speed limits, particularly in the Agricultural Zone which is populated by the local community. - Maintain vehicles and include details on inspections. - Zero tolerance for alcohol and illegal drugs. Monitoring and evaluation of traffic and transport incidents;	
Waste	General construction activities. Waste generated by workforce. Poor housekeeping.	Temporary disposal of excavated material. Visual impact of uncontained / windblown waste / litter. Impact on soil water resources from poor management / hazardous wastes.	- Develop and implement a Waste Management Plan for the construction phase; - Avoidance of refuelling on site to prevent oil spills. If this is not possible procedures will be developed to avoid accidental spillage, like the provision of drip trays and bunding for stores of fuel and waste chemicals; - Responsible storage and disposal of liquid effluents; - Provide a dedicated and adequate storage area for waste; - Establish and implement proper practices of waste segregation at source, reuse where feasible, and recycling of wastes by the registered operators; - Appropriate handling and storage of hazardous waste only from the licensed collection, transport, and waste treatment operators.	***Minor – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
Habitats and protected areas	Site clearance work removing soil and surface vegetation. Pollution of the drainage channels could transfer pollution to protected areas. Poor management of solid waste and waste water, improper disposal of excavation material.	Potential negative impacts on habitats and protected areas	- The loss of the habitat "1310 Salicornia and other annuals colonizing mud and sand" that will be affected by the PV plant. This could include planting of native vegetation in these adjacent areas. - The irrigation and drainage pattern/network scheme around the PV plant site and areas of work for the OHL towers shall not be altered, but kept disciplined and functional to the maximum extent possible with the natural/ existing water flowin. - Limit site clearance activities to only those areas where this is required. - To minimise habitat loss to the extent practicable, areas scheduled for habitat and land clearance will be demarcated and mapped in advance and personnel informed that any activities outside the designated areas will be strictly forbidden except for entry and exit along designated access routes. - Environmentally sensitive areas and critical habitats in surroundings of the project areas will be clearly marked and mapped as 'No-Go Areas'. - Bushfire controls will be developed for the Project, including a Project ban on open burning of waste by the local communities; specific emergency response procedures developed for managing bushfires and the establishment of fire breaks where required. - Ensure implementation of appropriate measures for the management of site clearance and excavation activities, and soil and waste management both within PDA and along the OH. - Furthermore, the Owner will develop a Biodiversity Management Plan (BMP), covering both the construction and operation phase of the project.	***Minor – PV plant and OHL***
Vegetation and flora	Ground clearance at construction sites (PV plant and tower pylon) and during laying of access routes.	Impact on local flora, including rare species.	- ; - Develop and implement a Biodiversity Management Plan (BMP), covering both the construction and operation phases of the project; BMP will identify measures to rehabilitate the site post-construction, including the re-establishment of native plant species within the PDA that support biodiversity compensation;	***Minor – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
			- Worker awareness and training sessions in relation to the protection of local flora; - Routine checks to ensure vegetation clearance is confined to defined areas of disturbance and periodic checks will also be undertaken by supervising engineers.	
	Alien Invasive Species	Alterations in the existing habitats and ecosystem due to alien invasive species	An alien invasive species protocol will be developed (by an experienced ecologist) within the BMP and implemented to minimise the risk of transferring and introducing alien invasive species into the project area.	***Negligible – PV plant and OHL***
Terrestrial fauna and avifauna	Construction activities involving clearing of vegetation, excavation of soils, movement of vehicles or equipment over roads and terrain, loading and unloading of materials. Poaching, intentional killing of animals.	Injury or mortality of fauna and avifauna; Disturbance of fauna and fragmentation of habitats	- Develop and implement a BMP that covers the construction and includes the identification and implementation of biodiversity enhancement measures; - Perform a pre-construction survey pre-clearance check of key potentially habitats and species, prior and during the construction works; demarcate the area and install warning signs for workers/drivers; - Avoid construction works during the breeding season, i.e., between late March to mid-August, avoid night hours; and ensure that work activities do not occur outside of designated areas of the project; - Worker awareness, training, and enforcement of strict regulations in relation to the protection of local fauna; Establish temporary or permanent provisions for fauna to cross the working strip/ roads;	***Minor – PV plant and OHL***
Land Acquisition, Land Use and Livelihood	Temporary and permanent loss of agricultural land, in particular for the OHL.	Impacts to livelihoods – potential loss of income.	Develop and implement a Livelihood Restoration Plan (LRP) that will manage the economic impacts on farmers affected by OHL construction; The LRP will be in-line with EBRD PR5 and IFC PS5 and national requirements. The plan includes the following elements:	***Minor – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
			- Avoid to the extent possible locating the project site on farmed land or land with the presence of fruit trees or other assets; Minimize the amount of land occupied during construction; - Ensure access for herders and herding activities through the PV plant; - Develop and provide appropriate compensation in line with market value,national legislation and international standards; - Ensure fair compensation for land use and crops for both landowners and users; - Support the vulnerable groups and individuals in the completion of the necessary documentation to obtain land ownership certificates. - - Provide timely compensation (prior to actual impacts occurring) for loss of assets at full replacement cost; - - Develop and implement a consultation process with local residents affected by the project and other stakeholders; - Fully reinstate leased land and ensure it is handed over in its original conditions; and develop appropriate livelihood restoration programmes, where livelihoods have been significantly impacted and monetary compensation is not sufficient.	
Employment and local economy	Employment opportunities for construction works.	Increased employment opportunities - Positive impact to communities.	Contractor should develop and implement a Local Labour Management Plan (LLMP) that maximize the use of local workforce and benefits to the local communities and prioritize employment of vulnerable individuals and of women". Refer to ESIA for all recommended mitigation measures. - Prioritize employment of members of vulnerable groups and individuals; - Ensure priority of women owned businesses during the procurement process; - Ensure Voltalia's "Ethics Guide and Code of Conduct" is enforced also in the supply chain, so all contractors, subcontractors and suppliers shall comply with it.	***Moderate positive – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
			- In order to increase women employment opportunities, the following measures should be taken by Voltalia: - Provide equal trainings for men and women; In field training during the development of implementation phase, also through Contractor/s and Sub-Contractors; - Define number of persons to be interviewed for a new position which need to be women;	
Infrastructure and Community Services	Work activities and unintentional damages	Potential deterioration and interruption of community services and infrastructures	- Develop and implement good construction practices (part of CESMP) to control construction activities and avoid and minimize impacts on local infrastructure and services; - Liaise closely with communities and local authorities about any disruptions or disturbance on infrastructures (road closure, water distribution, energy distribution) that might be caused by construction activities. - Repair promptly - - - -	***Minor – PV plant and OHL***
Occupational and community Health and Safety	Safety and security risks derived from project construction activities Emission of dust, noise and vibration Unauthorized acces and vandalism	Potential impacts on community health, safety and security. Risks on occupational health and safety and security Risk of GBVH	- Develop and implement an Occupational Health and Safety Management Plan (OHSMP) to take care the workers' health and safety and will cover all related health and safety matters, emergency preparedness and response, incident and disaster management, identification and management of hazards and risks associated with the workplace, etc; - Train and make aware the workforce - on understanding sexual harassment in the workplace, and on how to respond to allegations of sexual harassment in the workplace; on how to respond to allegations of GBVH perpetrated by employees and contractors in affected communities;	***Minor – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
			- Implement a confidential grievance mechanism for making anonymous reports of incidents of sexual harassment in the workplace; Appoint a CLO who will manage the possible causes related to GBVH or harassment. - Refer to ESIA for all recommended mitigation measures.	
Cultural Heritage	There are no known potential objects in the Project area of cultural or archaeological significance.	Potential damage to cultural or archaeological objects, which are newly discovered during construction groundworks.	- Develop and implement a Cultural Heritage Management Plan (CHMP) to providing mechanisms for the identification, protection and management of cultural heritage finds during construction, in order to avoid all potential damages to cultural resources and assets; - Perform a pre-construction survey in specific key locations prior to the commencement of construction works; - Develop and implement a Chance Finds Procedure Plan in case of incidental archaeological discovery;	***Negligible – PV plant and OHL***

4.2 Operation phase

Photovoltaic projects are passive in nature and do not generate significant wastes, emissions to air, pollution to water or noise and are generally considered to have a limited impact on the environment and surrounding communities. Below is a summary of the identified impacts and associated mitigation measures to minimise any residual impact.

Table 3. Environmental and Social Components – Operation Phase

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
Land Acquisition, Land Use and Livelihood	Permanent loss of agricultural land for the PV plant area and OHL towers.	Impacts to livelihoods – potential loss of income.	Although not very likely, manage any temporary need or impacts on land required for maintenance of the project facilities, following the same procedures as before construction. Uitilize the Grievance Mechanism to support households who may suffer impacts from maintenance works during operations to address any claims to OST, which will be the sole owner of the OHL after its construction.	***Negligible – PV plant and OHL***
Landscape and Visual	Presence of panels and transmission line Presence of rehabilitated and restored areas	Long-term changes to the landscape. Major new visual item in the scenery for small number of local residents. Glare (and glint) caused by sunlight reflected off the PV panel arrays.	- All mitigation and replacement planting should be suitably protected, maintained and monitored during medium term establishment for a minimum of 5 years; - Post-construction care of all rehabilitated and restored areas; - All mitigation and management measures for the restoration process of project-affected areas, will be included in the Biodiversity a Management Plan (BMP).	***Minor – PV plant and OHL***
Physical receptors (air quality, soil, hydrology)	Occasional visits to the PV plant to undertake inspection and maintenance activities.	Dust generation. Vehicle emissions. Fuel / oil spills from vehicles or machinery.	Develop and implement a Project Environmental and Social Management Framework for the operation phase, including provision for good working practices in relation to maintenance of vehicles and machinery, traffic management, proper use of resources, use, storage and handling of chemicals, etc; Reduce the water demand of the project by using monthly dry-cleaning techniques, and wet cleaning only on a quarterly basis; Installation and use of rainwater harvesting and steam cleaning equipment and prohibiting extraction of groundwater or surface water for operation activities of the project.	***Negligible – PV plant and OHL***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
Climate Change and resilience	N/A	Potential impact on equipment and personnel due to increase in extreme weather event.	Ensure potential changes in climatic conditions are considered when setting the design conditions in terms of maximum and minimum temperatures, wind loading, and rain events, with drainage system and foundations of the buildings based on at least 1 in 100-year rainfall / flood events; - Avoid or minimize the use of SF6; - use - alternatives to SF6, with a low global warming potential; - -	***Negligible – PV plant***
Biological receptors (including avifauna)	Occasional visits to the PV plant and OHL to undertake inspection and maintenance activities.	Impact of operation vehicles on local flora and fauna. Potential damage to flora and fauna from chemicals used during maintenance.	- Develop and implement the ESMP and BMP that specify appropriate measures for the management of maintenance activities, training and awareness of staff for the preservation of biodiversity values, and soil and waste management both along the PV solar plant and OHL, as well as for associated infrastructure; etc. - Avoid potential damage to local fauna by using only designated access tracks, maintenance of traffic and the appropriate handling and use of paints and chemicals; - Identify and implement any biodiversity enhancement measures and provide the scope for ongoing biodiversity monitoring; - Ensure access of fauna within the PV area (under the fence to ensure that small faunal species can continue to move freely through the site); - Cultivation of the specific plant species (e.g., medicinal plants) which provide good cooling effect below the PV panels; - Apply bird protection measures: visual bird diversion techniques, - use of aluminium-coloured frames to reduce impact on birds. - The use of pesticide for the management of alien invasive species will be under strict control and on as necessary. No agents identified as being prohibited will be used and wherever possible mechanical means will be the preferred method.	***Negligible – PV plant and OHL***
Waste	Occasional maintenance visits.	Generation of electrical and packaging waste.	- Develop and implement a Waste Management Plan (WMP) in compliance with Albanian legislation that will include arrangements for the disposal of hazardous and non-hazardous waste through licensed waste disposal subcontractors/ companies.	***Negligible – PV plant***

Component	Issues from Project activities	Potential impacts	Proposed Mitigation Measures	Impact significance (post mitigation)
Employment	Employment opportunities for operation/ maintenance works.	Increased employment opportunities - Positive impact to communities	- Develop and implement a Human Resources policy that maximize the use of local workforce and benefits to the local communities and prioritize employment of vulnerable individuals and of women", Non-discrimination and equal opportunities to all workers; - Voltalia will control and monitoring activities regarding constructors' actions for employment, social, health and safety, and cultural heritage aspects of the Project; - Implement a grievance mechanism open to employee and non-employee workers; Refer to ESIA for all recommended mitigation measures.	***Minor to moderate positive – PV plant***
Health and safety	Operation and maintenance of the PV; Operation and maintenance of the OHL; Generation of electric and magnetic fields around OHL route cables.	Potential impact on health of local residents: Potential for electrocution; Electromagnetic Fields (EMF) Lightning strike and fire; and Issues associated unauthorised access and vandalism	- Develop and implement an Occupational Health and Safety Management Plan, in line with international and national standards; - Provide information to farmers and workers to reduce potential exposure under OHL, as well as on safe working practices; - - Apply techniques to prevent the electrocution hazards include: use of signs, barriers and educational signs/ public outreach to prevent public contact with potentially dangerous equipment, b) Grounding conducting objects (e.g., fences or other metallic structures) installed near power lines, to prevent shock; provision of automatic fire detection systems, etc. Regular monitoring by OST to verify illegal connections and of landowners or land users not complying with restrictions, etc.	***Negligible – PV Plant and minor for OHL***

5. Environmental and Social Management and Monitoring Framework

An Environmental and Social Management Plan (ESMP) is developed to provide a guide for the Project Developer – "Karavasta Solar shpk" (Project Owner), and its EPC Contractor, in the formulation of appropriate management systems, plans and procedures to ensure compliance with national and lender E&S requirements. The requirements set out in the subsequent project ESMP will be included within contractual documentation with the relevant parties, as appropriate, to ensure there is clarity and commitment regarding Contractor's obligations related to E&S and H&S management of the Project.

Management of impacts and opportunities at relevant stages of the Project development should be considered in the ESMP, from design through to mobilisation and construction and into the operational phase.

Monitoring and reporting processes required to ensure the appropriate implementation and efficacy of the management plans and procedures. These processes are also necessary to meet national and lender requirements as well as promoting transparency to all project stakeholders.

6. Approach for resettlement and restoration of livelihoods

6.1 Introduction

According to the results of the baseline study, lease of privately-owned land is rare in the area and therefore the likelihood of the existence of users of land, who are not owners, is small. In any case, the Livelihood Restoration Plan (LRP) that will be developed for the Project will ensure that all land users affected by the project, including those that are not land owners will be compensated for losses of crops at full replacement cost and, pasture or forest. The state land users will be compensated for the loss of crops and/or pasture.

Land that will be permanently acquired, or temporarily leased, will be compensated to land owners and land users in line with the indications of LRP, to be prepared in line with National Legislation, and EBRD and IFC standards. In addition, compensations will be provided when project impacts will occur on crops, trees, pastures and other assets present within the Project footprint, both for permanently acquired and leased land.

The LRP will be developed, including supporting documents and plans, prior to construction and prior to resettlement actions.

6.2 Organisational responsibilities

A social team will be established to manage the livelihood restoration issues as well as compensation issues. Karavasta Solar shpk management will be responsible for the operation of this team, conduct pre-construction socioeconomic surveys of the areas potentially impacted by the project, assessing the likely social impacts of the project options; prepare a profile of beneficiaries for each option; prepare a program for monitoring and evaluating the benefits and impacts of the project before and after construction.

A Community Investment Plan will be developed to ensure good relations with neighbouring communities, to compensate for unspecific communal impacts and to share benefits. This plan will cover all PDA and OHL area and will be implemented during construction and in the first 5 years of operation. Budget will be allocated directly annually from Project outcomes.

The CLO will be regularly communicating with local stakeholders and other project-affected households, villages, communities and government authorities, to address the socio-economic matters in relation to livelihood restoration planning, documenting the existing households, land use and infrastructure that might be affected by the project activities.

7. Grievance mechanism

7.1 Introduction to the mechanism

Grievances may include any complaints, requests or suggestions about the way a project is being implemented. They may take the form of specific complaints for damages / injury, concerns about routine Project activities, or perceived incidents or impacts. Identifying and responding to grievances supports the development of positive relationships between projects and the local communities, and other stakeholders they may be affected. Grievance mechanisms therefore provide a formal and ongoing avenue for stakeholders to engage with the Developer and EPC Contractor, whilst the monitoring of grievances provides signals of any escalating conflicts or disputes.

This mechanism will be developed and designed in such a way that is appropriate for stakeholder groups in order to properly understand upcoming issues and communication challenges that may be faced in regard of the project implementation (e.g., language, literacy levels, level of access to technology). The Developer and the Consultant have already informed the local communities and stakeholders about the grievance mechanism during the ESIA process. It will be further developed in the course of the stakeholder engagement process throughout all project phases, in particular during construction phase.

This grievance mechanism will acknowledge and address all feedback and grievances over both real and perceived impacts in the same way, and with the same level or care.

7.2 Grievance Processing

The Affected People (APs) and all stakeholder groups will have the opportunity to file complaints and queries on any aspect of Project activity and land acquisition. The GM is presented during all public consultations and published online. The developer will ensure that grievances and complaints on any aspect or issues that may arise, are addressed in a timely and satisfactory manner.

All possible avenues are made available to the APs to resolve their grievances at the project level. Under the project level grievance mechanism, affected households may appeal any decision, practice or activity connected with the resolution of a grievance.
APs will be made aware of the procedures they can follow to seek redress, including, if necessary, resort to administrative or judicial procedures as well as Lenders' grievance mechanisms. The project GM will be disseminated to APs through the consultation meetings, Focus Group Discussion, and Key Informant Interview as well as published on the Project's website.

The grievance management process is illustrated figure below:

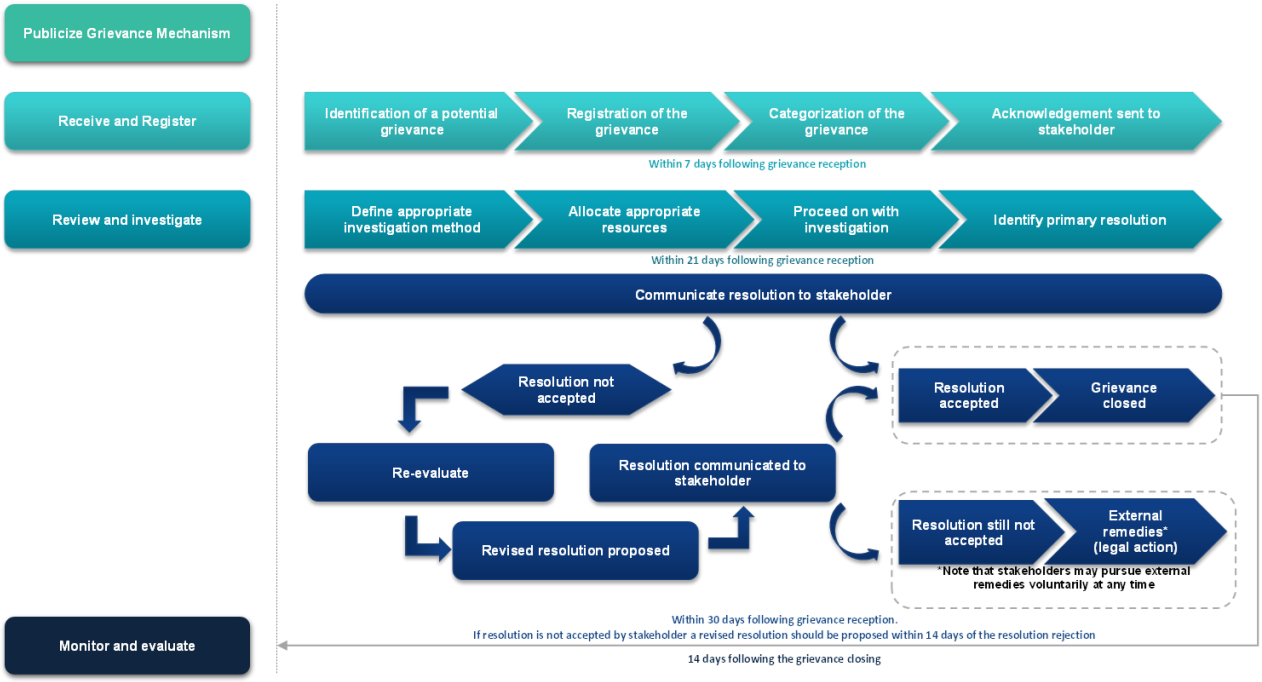


Figure 8. Grievance Processing Workflow

7.3 Grievances Submission

A Public (Third-Party) Grievance Form will be used for submitting grievances. It will be available in hard copies in local administration (local communities, municipalities and the regional offices), as well as in an electronic version on the project's website. However, other written letters, emails, text messages and phone calls can also be used for submitting grievances, as described below. Stakeholders and affected persons will be able to submit a grievance in relation to the project, at any time and at no cost, by using one or several of the following ways:

Through the electronic grievance form on the project's website: https://karavastasolar.com/grievance/
Submitting a written or verbal grievance during a public meeting.
Handing or mailing a written grievance to the Local Management Team or the Community Liaison Officer (CLO).
Calling the Community Liaison Officer (CLO).) through the dedicated phone number: +355684027034, or sending an e-mail to karavasta@voltalia.com.
Through complaint boxes that will be submitted at all entry points to the Karavasta project site.:
Postal address where can be sent Grievance Form:
Bulevardi Bajram Curri, Qendra biznesit Europian Trade Center ETC, Kati 9, Zyra 3, Tirana, Albania.