

Energopark Yavoriv

Yavoriv Solar Project, Phases 1 and 2

Project Non-Technical Summary (Environmental, Safety and Social Management)



Yavoriv-1 and 2 Solar Project

Non-Technical Summary

Updated 02/05/2019

1 Introduction

This document provides a non-technical overview of the proposed development plans of private company *Energopark Yavoriv* to construct a solar photovoltaic power plant in Lviv Oblast of Ukraine.

It also presents a summary of potential environmental and social impacts and other environmental and social issues relevant to the project activities. Appropriate measures to mitigate key adverse environmental and social effects that may arise during project construction and operation are provided in *Table 1* at the end of this document.

The project developer *Energopark Yavoriv* has funding from the European Bank for Reconstruction and Development (EBRD) for financing this development. The project is thus subject to EBRD's 2014 Environmental and Social Policy and has been determined as a Category B project.

This Non-Technical Summary (NTS) document, and a Stakeholder Engagement Plan (SEP) for the project will be placed in the locations shown below for public review and comment:

- *Energopark Yavoriv* company offices
Address: : Sichovyh Strilciv str. 12/9, Lviv, 79007
Phone: +38 032 2610776
- Ternovytsa Village Council
Address: 32, Svobody str, Ternovytsa, Yavoriv district, Lviv region, 81060
Phone: + 38 032 59-68368, + 38 032 59-60100

Furthermore, the documents will be available online at www.uself.com.ua. Any interested party is encouraged to provide comments and suggestions on the environmental, social and other aspects of the project. For further information or comments please contact:

Name	Contact information
Maksym Kozytsky, Director	Company: <i>Energopark Yavoriv</i> LLC Postal Address: Sichovyh Strilciv str. 12/9, 79007, Lviv Telephone: +38 032 2610776 E-mail address: maxim@gaz.net.ua

2 Description of the Proposed Development

Yavoriv Solar Project – 1st Stage (in completion)

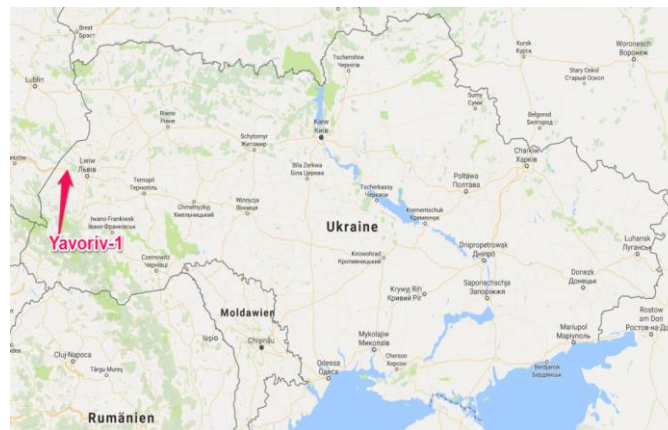
The 1st stage of the project has been to install 131 000 photovoltaic modules, which will provide an installed peak capacity of 36.752 MW, and approximately 36,000 megawatt-hours of gross electricity generated per year. The solar power plant will be operated on a total area of 115 hectares, that is leased for the project. The plant will be connected to the distribution grid by means of a 3.1km long underground transmission cable attached to an existing substation “Yavoriv” owned by Ukrenergo. Electricity will be sold to the grid at the “green tariff”.

Yavoriv Solar Project - 2nd Stage

Yavoriv solar project 2nd stage is currently under progression (as of May 2019). This will mirror the 1st stage and install an additional 35.096 MW of peak generation capacity, bring the project to a total capacity of 71.8 MW. The second stage of the project is being developed on the same land plot as the 1st stage, within the originally lease area, but utilizing the currently unoccupied / unused area to the north of the plot (towards the former Sulphur chemicals plant, now closed).

The Project is located near Ternovytsa village (900 residents) of Yavoriv district in Lviv Oblast. Three other villages, Lis, Solygy and Shklo, are located at 1.5km from the site. The project land plot comprises sulfur mining tailings of former chemical plant closed in 1990s, and cannot be used for any agricultural or heavy construction purposes. The location of the project site is shown on the Figures 1 and 2 below.

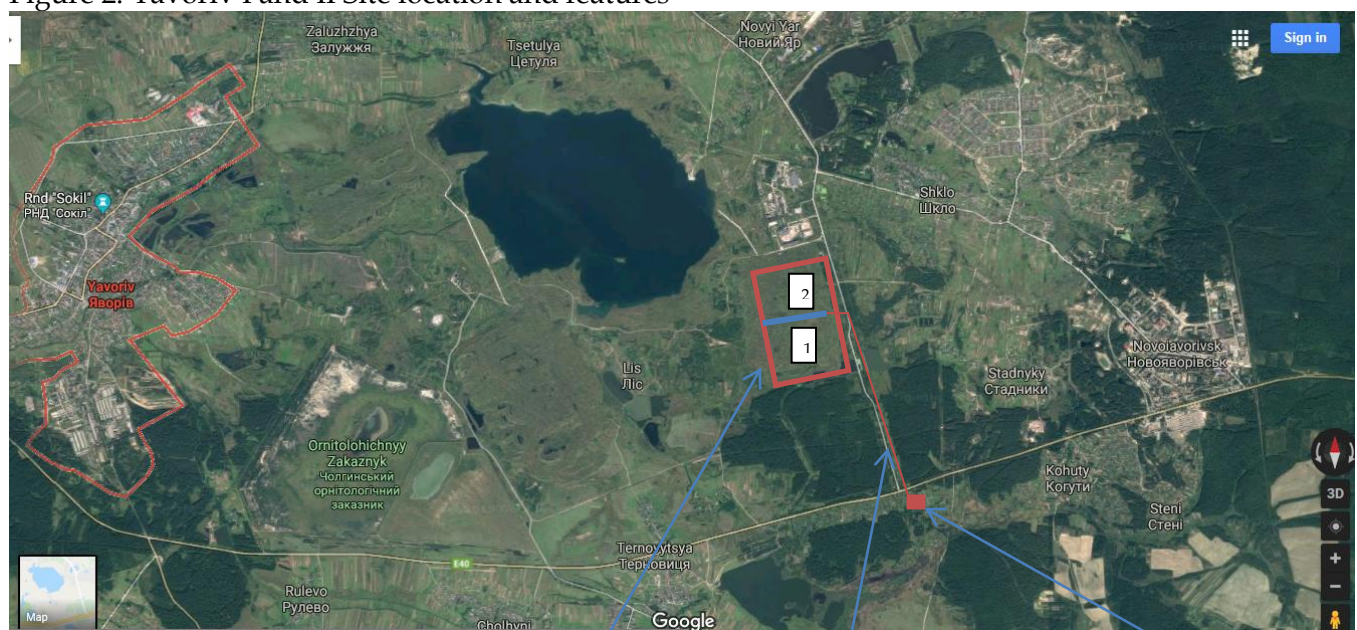
Figure 1. General map view



Source: Google Maps

The actual land plot is a south facing hill, artificially created through disposal of 'tailings' – waste materials from rock processing at the former chemical plant. To the North East of the plot is a large artificial lake.

Figure 2. Yavoriv I and II Site location and features



Solar plot (Yavoriv II is located to the north of the line)

110 KV underground cable

Sub station

Source: Google Maps, Energopark Yavoriv LLC

The project developer, *Energopark Yavoriv Limited Liability Company*, is owned by private individuals from Ukraine, who have been engaged in the development of renewable energy projects in Western Ukraine, including solar and wind power plants .

By employing the renewable solar power, the project will provide significant environmental benefits over other types of energy generation, such as those using fossils fuels (gas, coal) or nuclear. It will contribute to the reduction of emissions of greenhouse gases, create some temporary jobs, and improve the security of energy supply in the area.

3 Environmental, Health, Safety and Social Review

3.1 The Solar Project

The solar project is being developed on the 2nd part of the land plot, which is shown in the photo below (after commencement of the initial panel stands installation works).



The Yavoriv 2 project will mirror Yavoriv 1, which is shown in the photo below (shown during construction finalisation):



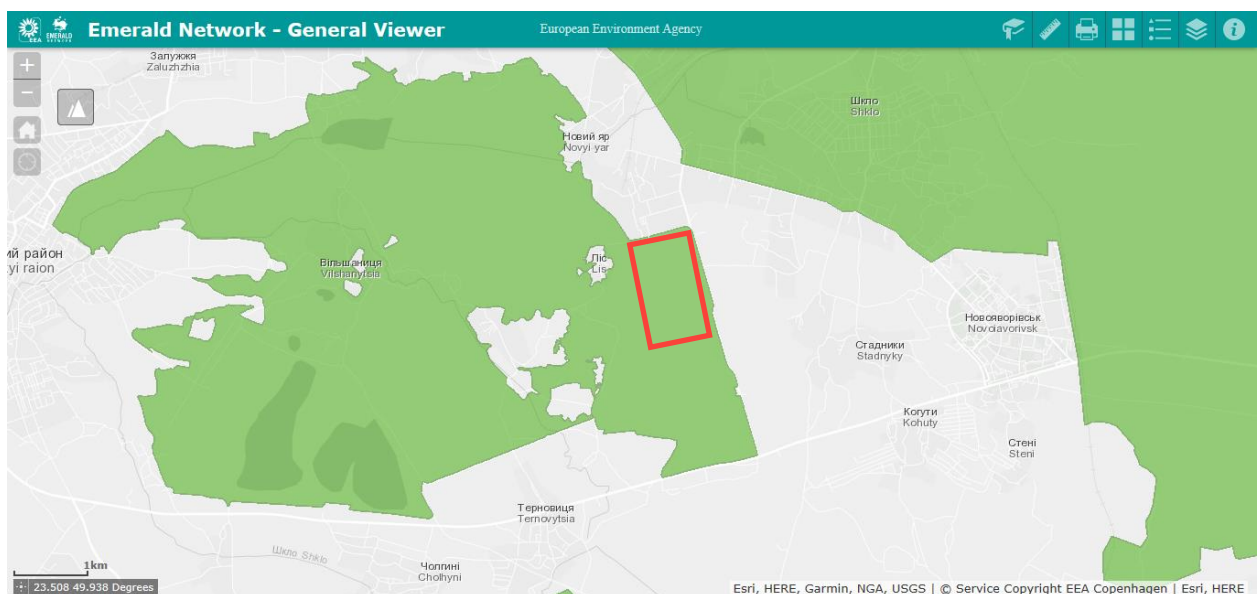
3.2 Sensitive locations

The project site is situated in an area of low environmental sensitivity. The land plot comprises the mining tailings of former Yavoriv chemical plant, which was engaged in sulfur mining and closed in early 1990s. This waste backfill land has low value, as it cannot be used for agricultural purposes or construction of heavy buildings and structures.

The operating plant will not generate any noise or flickering, and due to positioning has a low risk of glare, and thus should not provide any risk of disturbance to the residents of the nearby villages. The site is also located a good distance from the local village, some 900m from the nearest village.

Biodiversity Protected Areas:

The site is located in a large general area nominated as an 'Emerald Zone' – which has been designated for general biodiversity qualities. The specifically designated area is shown below (in green) with the land plot for the Yavoriv 1 and 2 solar project overlaid with the red line site boundary:



Details of the Emerald Site are as follows:

Emerald Site Name: Cholhynskiyi

Emerald Site Total Area: 33.4km²

Date site accepted as a designated Emerald Site: November 2016

Other Designated areas near to the project: An 'IBA' (International Bird Protection Area); the "Ornithological zakaznik Cholhynskiyi" was designated by a resolution of Lviv Oblast Council of Deputies on 11.02.1997 (#126). This is shown below and is around 7km from the site.



There are also a number of other areas in the general region of the site, such as the Roztochya Nature Reserve, well to the east of the site location.

Overall, the Ornithological Park and the general Nature Reserves are not considered likely to be impacted by the project, due to the general low impact nature of solar projects and the distance to these sites. However, in relation to the Emerald Zone, within which the solar plant site is located, the following general considerations are relevant:

- That this Emerald Zone is a broad area;
- That the solar site itself was a former industrial area, and comprises waste rock tailing from the former chemical plant. The site pre-clearance was not used for agriculture and the reeds which had naturally re-established were of a mono-culture type with little variety from a biodiversity perspective;
- The Emerald Zone key feature; the wetland areas and the lake, will not be directly affected by the project.

However, due to the project being present within the currently designated Emerald Zone, a specific further study is being undertaken as part of the Yavoriv Solar project Stage 2 arrangements. This study will review the potential for any specific mitigation or enhancement arrangements to be implemented on the project to in regards to biodiversity management. This is being undertaken as purely a precautionary measure as significant impacts are not expected, however, there could be potential for some enhancement, such as through the replanting strategy for the boundaries of the site incorporating plants of foraging value or as nectar rich sources for insects.

3.3 Project studies and documents

Solar energy power plants can be considered as generally having a low impact on the environment in their operations, and a positive overall benefit from a carbon emissions and energy security perspective. However, to assess and manage the potential impacts of the project, several environmental documents have been prepared, as explained below.

The project preparation included assessment of the environmental conditions of the site, surrounding area, as well as environmental and social impacts. These have been summarized as a separate section in the project design documentation. As part of the environmental and social due diligence, an Environmental and Social Action Plan (ESAP) has been developed. The ESAP identified mitigation measures to prevent or reduce potential negative impacts of the project.

A Stakeholder Engagement Plan (SEP) has been developed to describe how *Energopark Yavoriv* will communicate with people and institutions who may be affected by, or interested in the project, at various stages of project preparation and implementation. The SEP will be disclosed to the public. The company will assign a social liaison function to one of its staff, who will be responsible for keeping an open dialogue with stakeholder groups and local residents. At any time before and during construction and operation, any stakeholder can raise concerns, provide comments and feedback about the project. All such comments or grievances will be accepted, processed and answered by *Energopark Yavoriv* in a timely manner.

3.4 Project impacts and their mitigation

The evaluation of potential environmental and social impacts has determined that, in addition to its benefits, the project may have some negative impacts on the environment and people, if not managed carefully. Therefore, *Energopark Yavoriv* will implement certain actions (called “mitigation measures”) to prevent or reduce potential negative impacts of the project as outlined in the ESAP. Key mitigation measures are summarized in the table below.

Table 1 Overview of Key Potential Project Impacts and Their Mitigation

No	Issue	Potential impact	Mitigation measures
1	General construction activities	Impacts during construction of the main (solar modules and inverter stations) and associated (transmission line) project facilities, such as land excavation, dust, noise, air emissions from vehicles involved, vehicle traffic, etc.	<ul style="list-style-type: none"> - Prepare and implement construction management plan to reduce and mitigate general construction impacts, including noise, air emissions, waste generation and disposal, erosion. - Prepare and implement traffic management plan, including consideration of delivery routes, other road users, speed limits, and warning signs. - Ensure project contractors adhere to relevant environmental and social requirements. - Continuously monitor impacts to comply with appropriate national environmental standards and EBRD requirements.
2	Transmission line (underground cable)	Impacts of laying an underground transmission cable (110 kV, 3.1km) for grid connection, which will be located close to private gardening allotments and, possibly, some of the summer houses (“dachas”).	<ul style="list-style-type: none"> - Ensure appropriate design and routing of the transmission line to avoid sensitive locations where possible. - Comply with relevant sanitary, environmental and social requirements and norms, including those of the EBRD. - Conclude servitude agreements with the land-owners where relevant. - Mitigate any residual impacts after the completion of construction. - The underground nature of the cable will avoid any dangers to the public. However, the cable route will also be labeled and warning signs installed. The cable being installed underground also reduces any risk of bird collision or electrocution.
3	Management of soil erosion and surface run-off	Silted water run off.	<ul style="list-style-type: none"> - All areas of the solar project will be allowed to either re-establish vegetation naturally, or through a specific re-planting strategy (e.g. in boundary areas). This will ensure that the risk of silted water run-off will be avoided. - Further, geo-membranes will be incorporated into sloped areas of the site, again to avoid soil erosion on the slopes and provide slope stability.

			<ul style="list-style-type: none"> - Surface water run-off channels are being incorporated into the site design to direct surface water run-off from the site into the specifically intended areas.
4	Management of pollution risk – sewage, oils and fuel storage	Potential pollution of water.	<ul style="list-style-type: none"> - Storage tanks with secondary containment systems will be employed on the site, alongside spill kits. - Relevant personal will receive specific spill control training. - Fully contained toilet systems will be used on site, and removed off site for proper treatment and disposal. - No liquid wastes will be disposed to the ground or to water sources.
5	Waste Management	Waste disposal impacts	<ul style="list-style-type: none"> - A waste management plan and contract will be in place for the project. - Specific waste contractors will remove all waste from the site for proper disposal or recycling. - Any broken solar panels will be safely stored. They will be periodically disposed properly off site, with recycling options being selected wherever this is feasible based on quantity and reprocessing locations.
6	Plant decommissioning	Waste generation and disposal during decommissioning of the plant at the end of the 25-year life cycle.	<ul style="list-style-type: none"> - Ensure recycling and appropriate disposal of PV modules at the end of their lifetime in line with best environmental practices. - Become a member of international PV recycling network.